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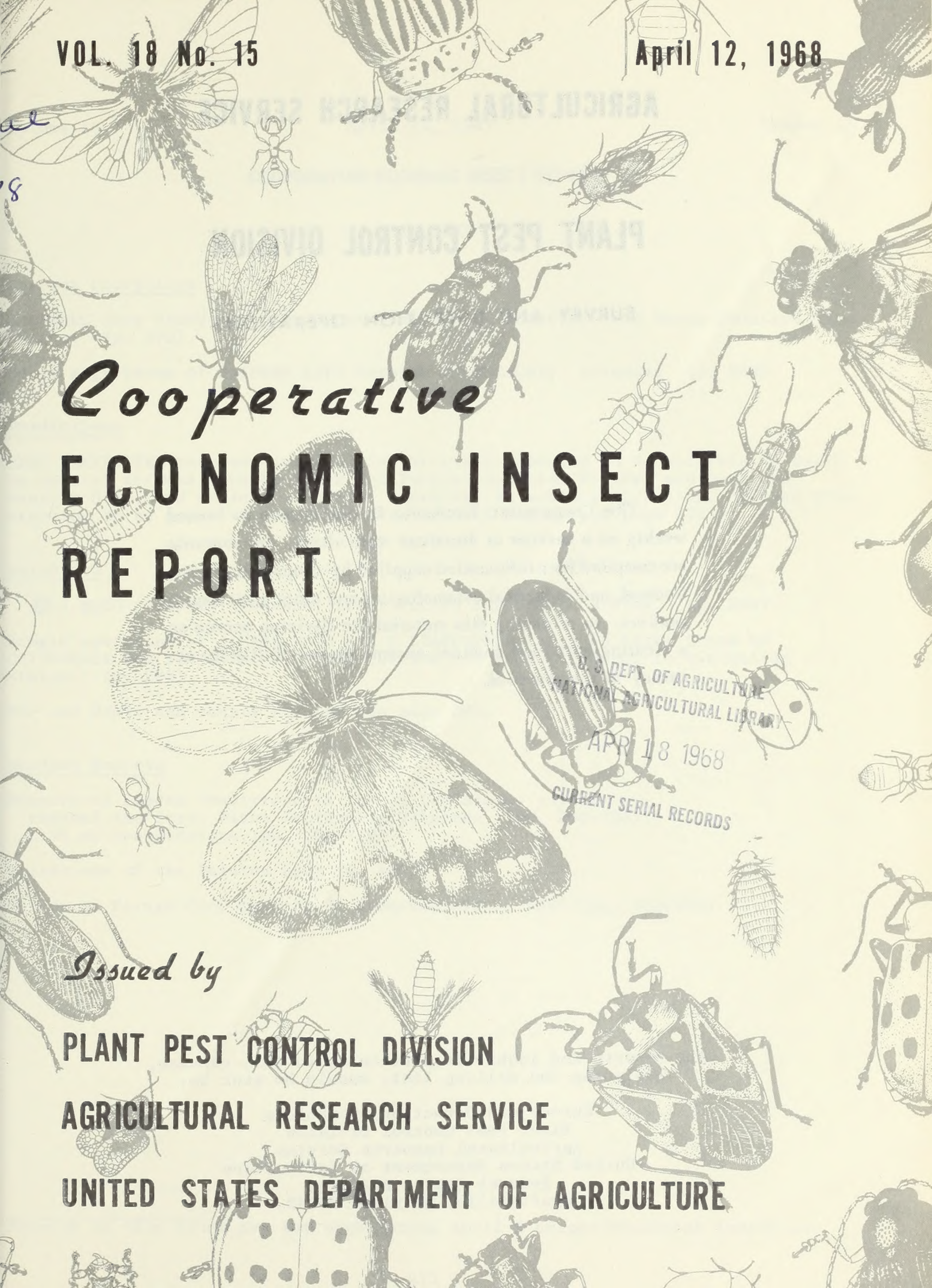

VOL. 18 No. 15 April 12, 1968

Cooperative ECONOMIC INSECT REPORT

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PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 18 April 12, 1967 Number 15

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG very heavy and causing much damage in Roosevelt and Curry Counties, New Mexico. (p. 273).

Heavy migrations of PAINTED LADY through Pima County, Arizona. (p. 282).

Predictions

BEET LEAFHOPPER movement into cultivated areas expected to be moderate to heavy in central Arizona, southeastern California, southern Nevada, southern and eastern Utah, and western Colorado. Movement to western Nevada and central Utah expected to be light to moderate. For special report see page 273.

Detection

● A SLUG reported in Texas; first record for United States. (p. 279).

Single specimens of a HAWK MOTH and a LEAFHOPPER taken in light traps in California and New Jersey. These species not known to occur in the United States. (p. 285).

For new State and county records see page 285.

Special Reports

Summary of Insect Conditions in the United States - 1967
  Federal and State Plant Protection Programs (pp. 286-298).
  List of Contributors (pp. 298-299).

Migrations of the Painted Lady (p. 300).

Survey of Forage Crop Insects in Massachusetts - 1967 (pp. 301-302).

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WEATHER OF THE WEEK ENDING APRIL 8

HIGHLIGHTS: Cold fronts brought changeable weather to much of the Nation with blizzards in the northern Great Plains and heavy thunderstorms and a few tornadoes in the middle Mississippi River Valley.

PRECIPITATION: Snow began falling early in the week in the northern Great Plains and spread southward. Strong winds drifted the snow badly and many roads became impassable. Hundreds of persons in Wyoming became stranded when their cars stuck in the snow. Many schools in South Dakota closed due to snow-clogged roads. Snow depths in northwestern and north-central Nebraska ranged from 10 to 20 inches. Extensive drifting occurred in the mountains of Colorado. Snow fell also above 6,500 feet in Arizona and above 4,000 feet in California. Moderate to heavy rains fell about midweek from the central Great Plains eastward to Virginia and the Carolinas and southward to the northern and central portions of the Gulf States. Amounts ranged up to 3-5 inches in the southern Appalachians. Tornadoes occurred in Iowa and Kentucky. Damage was not extensive but 2 persons were killed in Kentucky. Damaging wind and hail accompanied the thunderstorms in Illinois. This was the 3d very dry week in Florida. Only light precipitation fell in New Jersey and the coastal portions of New England. Other areas receiving only light rain extended from eastern Washington southward to the desert regions of California and from southeastern Colorado to western and southern Texas.

TEMPERATURE: Cold air plunged southward over the western portions of the Great Plains early in the week bringing cooler-than-normal weather to most western areas. Much of Wyoming and portions of nearby States averaged 3° to 6° below normal. Variable temperatures characteristic of spring prevailed over much of the East resulting in an erratic day-to-day pattern. The Lakes region and Northeast were mostly cooler than last week but still averaged above normal. Spots in the Lakes region averaged more than 3° above normal and portions of New York averaged 5° to 9° above normal. Temperatures along the gulf increased reversing the cool trend that had persisted there for several weeks. A cooler-than-normal area extended from Arizona to North Carolina. Parts of Texas, Oklahoma, southern Missouri, northern Arkansas, and the western portions of Kentucky and Tennessee averaged 3° to 5° cooler than normal. (Summary supplied by Environmental Data Service, ESSA.)

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

Second Beet Leafhopper Survey in Desert Areas of Central Arizona, Southeastern California, Southern Nevada, and Southern Utah: March 11-22, 1968

Rainfall during February and early March was sufficient to sustain host plants. Host vegetation is expected to remain green into April in all but the most western portions of the breeding areas.

Heavy local buildups of beet leafhopper (*Circulifer tenellus*) were observed in the Imperial Valley of California and the Moapa Valley of Nevada. Considerable buildup was observed in western Maricopa and eastern Yuma Counties, Arizona. Movement from desert areas to cultivated districts of central Arizona, southeastern California, southern Nevada, and southern Utah is expected to be moderate to heavy. Movement to eastern Utah and western Colorado is expected to be moderate to heavy. Movement to western Nevada and central Utah is expected to be light to moderate. Movement to northern Utah is expected to be light. (PPC West. Reg.). For results of preliminary survey see CEIR 18(9):125.

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - NEBRASKA - Ranged 0-4 (averaged 1.5) per linear foot on wheat in Red Willow, Gosper, Hitchcock, Furnas, Dundy, Chase, and Perkins Counties (Keith, Berberet); up to 20 per row foot at McCook, Red Willow County (Klein). Larvae averaged 2 per square foot on 3 alfalfa fields in Dundy County (Keith); up to 10 per square foot in Dawson County (Roselle, Andersen), and Lincoln County (Grabowski). KANSAS - Ranged 0-3 per square foot in Sedgwick, Pratt, Barber, Harper, McPherson, Saline, Lincoln, Russell, Osborne, Mitchell, Ellsworth, Rice, and Reno Counties. (Simpson, Redding). Ranged 0-2 per square foot in wheat in Logan County, 0-3 in Gove County, and 4-10 in Thomas, Rawlins, Cheyenne, and Sherman Counties. Counts per square foot of this species and *Agrotis orthogonia* by county: Wallace 0-2 and Greeley 0-3 (mostly *C. auxiliaris*); Hamilton 1-4 (60 percent *A. orthogonia*); Stanton 2-8, Morton 4-15, and Stevens 6-18 (90 percent *A. orthogonia*); Seward and Haskell 4-8 (60 percent *C. auxiliaris*). (Simpson). OKLAHOMA - Light to medium in wheat in Grant County. (Okla. Coop. Sur.). COLORADO - Larvae ranged up to 5 per row foot and damaged winter wheat in Weld, Yuma, Kiowa, and Baca Counties; some controls applied. (Alldredge et al.). WYOMING - Larvae moving from waste areas into lawns and flower beds. (Lowry).

ARMYWORM (*Pseudaletia unipuncta*) - MISSOURI - First larva of season taken from barley in Pemiscot County April 3; moths collected at lights in New Madrid County. (Munson).

GREENBUG (*Schizaphis graminum*) - NEW MEXICO - Very heavy and causing much damage in many fields in Roosevelt and Curry Counties. Ranged 1,000-2,000 per linear foot in 2 fields in Rogers and Causey area, Roosevelt County. Many heavily infested fields treated. (Smith et al.). OKLAHOMA - Ranged 50-200 per linear foot in wheat in southwest and west-central counties; light to medium in central, south-central, and north-central counties; heavy in scattered fields in northwest and panhandle counties. Parasitism by a braconid (*Lysiphlebus testaceipes*) increasing. (Okla. Coop. Sur.). ARKANSAS - Survey negative in small grains in northwest area. Aphids should not be problem on small grains for some time with presence of rapid plant growth and abundant soil moisture. (Boyer). KANSAS - Light, 1-10 per linear foot, in some southwest areas. (Simpson). NEBRASKA - Surveys negative in Furnas, Gosper, Red Willow, Hitchcock, Dundy, Chase, and Perkins Counties. (Keith, Berberet).

CORN LEAF APHID (*Rhopalosiphum maidis*) - ARIZONA - Light in all barley fields at Safford, Graham County; controls required in Yuma Valley and Welton and Roll areas of Yuma County. (Ariz. Coop. Sur.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - OKLAHOMA - Light in alfalfa field in Tillman County; 0-10 per sweep in McCurtain County and 2 per square foot of crown area in Garvin County. (Okla. Coop. Sur.).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (Ostrinia nubilalis) - MARYLAND - First pupa of season found April 4 near Easton, Talbot County. Spring plowing on Eastern Shore late. (U. Md., Ent. Dept.).

A CRAMBID MOTH (Chilo loftini) - ARIZONA - Heavy in unplowed field of milo stubble at Glendale, Maricopa County. (Ariz. Coop. Sur.).

TOBACCO THRIPS (Frankliniella fusca) - ALABAMA - Adults of this and other thrips species light to moderate on young corn in central and southern areas; less extensive in northern area. (McQueen).

SEED-CORN BEETLE (Agonoderus lecontei) - WISCONSIN - Few taken in Mazomanie blacklight trap. (Wis. Ins. Sur.).

SMALL GRAINS

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARIZONA - Light and scattered on barley at Benson, Cochise County; Tubac, Sahuarita, and Continental, Pima County; Casa Grande area, Pinal County; Salt River Valley, Maricopa County; and in Gila Valley, Yuma County. Found earlier on sugarcane along drainage canals at Yuma. (Ariz. Coop. Sur.). OKLAHOMA - Averaged 10 per linear foot in wheat in Garvin County; medium in wheat in Grant County. (Okla. Coop. Sur.). ARKANSAS - Light, 100-150 per 100 sweeps, on small grains in northwest area; 50+ percent of aphids parasitized. (Boyer).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Increasing in many fields in central and north-central areas; not toxic to wheat. (Okla. Coop. Sur.).

PALE WESTERN CUTWORM (Agrotis orthogonia) - OKLAHOMA - Heavy in dryland wheat in Texas County; controls underway. (Okla. Coop. Sur.). KANSAS - Ranged 3-10 per square foot in Finney County; some treatments applied. (DePew). NEBRASKA - Mostly third and fourth instars heavy, up to 10 (average 2) per linear foot, in northern Dundy and southern Chase Counties; light, less than one per linear foot, in southwestern Perkins County. (Keith). COLORADO - Larvae ranged up to 4 per row foot and damaged winter wheat southwest of Nunn, Weld County. (Alldredge, Johnson). (Also see army cutworm on page 273).

BRONZED CUTWORM (Nephelodes emmedonius) - COLORADO - Larvae in winter wheat southwest of Nunn, Weld County. (Alldredge, Johnson).

BROWN WHEAT MITE (Petrobia latens) - KANSAS - Feeding in southwestern area; 500-1,000 per linear foot in heaviest infested fields of Finney County. (DePew). Ranged 200-500 per linear foot in Logan, Thomas, Cheyenne, and Sherman Counties. (Simpson). OKLAHOMA - Counts up to 500 per linear foot in wheat in Grant County. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light to medium in many wheat fields over western half of State. (Okla. Coop. Sur.).

TURF, PASTURES, RANGELAND

TOBACCO THRIPS (Frankliniella fusca) - ALABAMA - Adults of this and other thrips light to moderate on Johnson and fescue grasses in central and southern areas; less extensive in northern area. (McQueen).

A BILLBUG (Sphenophorus phoeniciensis) - ARIZONA - Heavy at turf farm in Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (*Hypera postica*) - MARYLAND - Adult activity increasing in all sections; first *and second instars* infested 40-80 percent of alfalfa in Dorchester and Talbot Counties. (U. Md., Ent. Dept.). VIRGINIA - First to third instars infested all tips examined in small plot of alfalfa in Charlotte County and first instars infested 20 percent of tips examined in Montgomery County March 28; adults active but no larvae in Augusta County March 27. (Hendricks). Larvae light on Prince Edward County alfalfa.(Peery, Apr. 2). First and second instars medium in Hanover, Chesterfield, and Goochland Counties; some adults present. (Innes, Mar. 31). Infested one alfalfa tip in 25 on farms throughout Culpeper County.(Heltzel, Apr. 2). TENNESSEE - Larvae ranged 5-10 per square foot in alfalfa in Maury and Marshall Counties and 3-40 per sweep in Madison County. (Quillin). MISSISSIPPI - Mostly late instars per 40 stems on alfalfa in Pontotoc County averaged 64 on unflamed and 13 on flamed alfalfa. Pupation peak expected second week of April; adult emergence peak expected in late April. (Pitre). ARKANSAS - Young larvae collected in Hempstead County; much feeding damage evident. (Barnes, Boyer). This is a new county record. (Boyer). Larvae present in alfalfa in Lee County. (Roberts). Survey negative in Washington County. (Offut). OHIO - Egg hatch begun and first instars observed in Lawrence and Ross Counties. (Flessel et al.). INDIANA - Larvae averaged over 4 per square foot in alfalfa samples collected March 18-19 in 6 southwest district counties. Currently averaged one first instar per terminal in 8-23 percent of alfalfa terminals checked in southern quarter of State; no feeding damage evident. Alfalfa 1-4 inches high. (Huber). ILLINOIS - No adults or larvae found in field in southern area where larvae averaged 94 per sweep in 1967; cool weather responsible for delay in appearance. (Ill. Ins. Rpt.). MISSOURI - Young larvae feeding on alfalfa in Pemiscot and Dunklin Counties. First and second instars ranged 3-11 per infested terminal; 8-26 percent of terminals damaged. (Munson). SOUTH DAKOTA - Total of 4 adults trapped on stickyboards in 2 fields near Spearfish, Lawrence County, March 21-30. (Jones, Walstrom). WASHINGTON - Adults and young larvae taken from alfalfa in Vancouver, Clark County. (Shanks, Mar. 29).

EGYPTIAN ALFALFA WEEVIL (*Hypera brunneipennis*) - ARIZONA - Larvae averaged 80 per 100 sweeps in Maricopa *County alfalfa; treatments* continue in Yuma area, Yuma County. (Ariz. Coop. Sur.).

ALFALFA WEEVILS (*Hypera* spp.) - CALIFORNIA - Probably *H. brunneipennis* heavy in alfalfa plantings *in Escondido*, San Diego County, and *medium on clover* in Moorpark, Ventura County. Probably *H. postica* moderate on alfalfa in Fresno, Fresno County. (Cal. Coop. Rpt.).

CLOVER LEAF WEEVIL (*Hypera punctata*) - INDIANA - Larvae averaged over 2 per square foot in alfalfa *samples collected* March 18-19 in 6 southwest district counties. (Huber).

PEA APHID (*Acyrthosiphon pisum*) - MARYLAND - Averaged 4 per sweep on Dorchester County *alfalfa. (U. Md., Ent.* Dept.). INDIANA - Survey negative on alfalfa in southern area. (Huber). WISCONSIN - Egg hatch began about March 30; first and second instars in 1.5-inch alfalfa. (Wis. Ins. Sur.). ARKANSAS - Increased to 50-100 per 100 sweeps in alfalfa in northwest area; some winged adults. (Boyer). OKLAHOMA - Activity increasing throughout State. Highest counts ranged 5-400 per square foot of crown area in scattered fields in low sheltered areas. (Okla. Coop. Sur.). ARIZONA - Counts per 100 sweeps by county: Yuma 1,200; Pinal and Maricopa 1,000. Heaviest in older alfalfa. (Ariz. Coop. Sur.). NEVADA - Continues heavy in untreated fields in Pahrump Valley, Nye County; lighter in treated fields. Controls poor due to cool weather. A braconid (*Aphidius* sp.) increasing but not too effective in controlling aphids.(Johnson, *Zoller).* CALIFORNIA - Medium on alfalfa in Fresno, Fresno County. (Cal. Coop. Rpt.).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - ARIZONA - Ranged 40-90 per 100 sweeps on alfalfa in *Yuma, Yuma County; very* light in most other areas of State. (Ariz. Coop. Sur.).

CLOVER LEAFHOPPER (*Aceratagallia sanguinolenta*) - WISCONSIN - Adults averaged 5 per 30 sweeps in Dane County alfalfa. (Wis. Ins. Sur.).

MEADOW SPITTLEBUG (*Philaenus spumarius*) - INDIANA - Survey negative on alfalfa in southern area. (Huber).

LYGUS BUGS (*Lygus* spp.) - NEW MEXICO - Adults remain light, 2-5 per 50 sweeps, in alfalfa in southern Dona Ana County. (Elson).

WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) - ARIZONA - Ranged 5-8 per terminal in alfalfa at Yuma, Yuma County; 1,000 per 100 sweeps on west side of Salt River Valley, Maricopa County. (Ariz. Coop. Sur.).

TOBACCO THRIPS (*Frankliniella fusca*) - ALABAMA - Adults of this and other thrips light to moderate on clovers and other plants in central and southern areas; less extensive in northern area. (McQueen).

SUGARBEETS

BEET ARMYWORM (*Spodoptera exigua*) - ARIZONA - Total of 200 adults caught in blacklight trap during very short period in Tucson, Pima County. (Ariz. Coop. Sur.).

YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) - ARIZONA - Light in 25-acre field at Tolleson, Maricopa County. (Ariz. Coop. Sur.).

SUGAR-BEET ROOT MAGGOT (*Tetanops myopaeformis*) - COLORADO - Larvae 0-10 per square foot in old fields 7 miles east of Fort Collins, Weld County. Found at depth of 2-4 inches in plowed fields and 6-8 inches in unplowed fields. (Alldredge, Johnson).

POTATOES, TOMATOES, PEPPERS

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Moderate and increasing on potato vines on west side of Salt River Valley, Maricopa County; controls applied to tomatoes at Yuma, Yuma County. (Ariz. Coop. Sur.).

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - First instars light on potato foliage in Surprise area, Maricopa County. (Ariz. Coop. Sur.).

BEANS AND PEAS

A LYGAEID BUG (*Sphragisticus nebulosus*) - DELAWARE - Adult collected in lima beans in Overbrook, Sussex County, July 21, 1964, by P. P. Burbutis and L. P. Kelsey. Det. by J. L. Herring. This is a new State record. (Burbutis).

COLE CROPS

CABBAGE APHID (*Brevicoryne brassicae*) - CALIFORNIA - Medium on collard plantings in Hollydale, Los Angeles County. (Cal. Coop. Rpt.).

CUCURBITS

MELON APHID (*Aphis gossypii*) - ARIZONA - Becoming established on cantaloups at Yuma, Yuma County; spring flights reaching peak. (Ariz. Coop. Sur.).

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - Few second instars on cantaloups at Yuma, Yuma County. (Ariz. Coop. Sur.).

GENERAL VEGETABLES

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - Newly hatched larvae on mature lettuce in northwest Phoenix area, Maricopa County. (Ariz. Coop. Sur.).

BEET ARMYWORM (*Spodoptera exigua*) - ARIZONA - Damage light in 20-acre onion field near Peoria, Maricopa County; very evident on field margins. (Ariz. Coop. Sur.).

LYGUS BUGS (*Lygus* spp.) - ARIZONA - Heavy in mature lettuce field at Casa Grande, Pinal County. (Ariz. Coop. Sur.).

HARLEQUIN BUG (*Murgantia histrionica*) - OKLAHOMA - Medium on vegetables in Marshall County; first report of year. (Okla. Coop. Sur.).

VEGETABLE WEEVIL (*Listroderes costirostris obliquus*) - CALIFORNIA - Larvae medium and damaging leaves in carrot planting in Bonita, San Diego County. (Cal. Coop. Rpt.).

WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) - ARIZONA - Averaged 8 per head of lettuce in Peoria area, Maricopa County. (Ariz. Coop. Sur.).

ONION THRIPS (*Thrips tabaci*) - ARIZONA - Averaged 7 per plant in Surprise and Glendale areas, Maricopa County; mottling of foliage evident. (Ariz. Coop. Sur.).

DECIDUOUS FRUITS AND NUTS

APPLE GRAIN APHID (*Rhopalosiphum fitchii*) - INDIANA - Most overwintering eggs hatched in Vincennes area; nymphs feeding on new foliage. Two-spotted and convergent lady beetle adults on foliage. (Dolphin, Apr. 1). First egg hatch of season in Tippecanoe County April 4, nymphs feeding on new apple foliage. (Mathew). OHIO - Eggs hatching in southern counties; nymphs light on apple leaf buds in Hocking County. Apple foliage developing in south-central area. (Rose).

APPLE APHID (*Aphis pomi*) - VIRGINIA - Very light; first hatch on apple trees March 17. (Bobb, Allen).

WOOLLY APPLE APHID (*Eriosoma lanigerum*) - ARIZONA - Moderate on untreated apple trees in Safford area, Graham County. (Ariz. Coop. Sur.).

ROSY APPLE APHID (*Dysaphis plantaginea*) - VIRGINIA - Most overwintering eggs hatched March 25-30; infestations light. (Bobb, Allen).

WHITE PEACH SCALE (*Pseudaulacaspis pentagona*) - FLORIDA - All overwintered females dead; eggs hatched and most crawlers in sedentary stage. Total of 78.2 percent of crawlers in first sedentary stage and 21.8 percent in second sedentary stage. Males all preadult except for few winged forms. All finds on peach at Gainesville, Alachua County. Det. by L. C. Kuitert. (Kuitert).

ARMORED SCALES - CONNECTICUT - *Aspidiotus perniciosus* troublesome on apple in 2 blocks at Bantam, Litchfield County. (Savos, Apr. 2). MISSOURI - *Lepidosaphes ulmi* collected from apple in southeast area. (Craig).

PEAR PSYLLA (*Psylla pyricola*) - CONNECTICUT - Adults active at Storrs, Tolland County; few eggs present. (Savos, Apr. 2).

TARNISHED PLANT BUG (*Lygus lineolaris*) - VIRGINIA - Adults heavy on peaches in mid-March; most disappeared by April 2. Damage very light. (Bobb, Allen). INDIANA - Few adults collected in apple trees in Vincennes area. (Dolphin, Apr. 1).

PLUM CURCULIO (*Conotrachelus nenuphar*) - VIRGINIA - Adults very light; first noted March 22. (Bobb).

EUROPEAN RED MITE (Panonychus citri) - CONNECTICUT - Overwintering eggs heavy on apple trees in Woodstock area, Windham County. (Savos, Apr. 2). VIRGINIA - Spotty, up to 5-6 mites per apple leaf; hatch 13 days earlier than average date of April 14. (Bobb, Allen).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - VIRGINIA - Larvae attacking wild cherry and abandoned apple trees in northern and eastern areas. (Allen, Amos, March 4). OHIO - First early instars and webbing observed on apple trees in Ross, Jackson, and Lawrence Counties; initial egg hatch in progress. Damage insignificant to cherry and apple trees. (Rose). TEXAS - Heavy on plum trees in Brazos County. (Randolph, Lipe, Mar. 29).

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - INDIANA - Adults numerous and egg cluster present on apple trees in Vincennes area. Total of 1,248 males collected in 30 traps containing 750 females in 5-acre orchard; 557 of total taken March 29-30. (Dolphin).

PEACH TREE BORER (Sanninoidea exitiosa) - OKLAHOMA - Adults emerging in Marshall County. (Okla. Coop. Sur.).

A NOCTUID MOTH (Orthosia hibisci) - OHIO - Moths unusually active March 21 and April 2; no oviposition evident. (Rings).

ORIENTAL FRUIT MOTH (Grapholitha molesta) - VIRGINIA - Pupation 80 percent in cages; no adults. Adults expected April 9, nearly 2 weeks earlier tha usual. (Bobb, Allen).

CODLING MOTH (Carpocapsa pomonella) - VIRGINIA - Total of 5 percent of caged larvae pupated; no adults. (Bobb, Apr. 2).

HICKORY SHUCKWORM (Laspeyresia caryana) - TEXAS - Moth emergence begun in Brazos County. (Welch, Mar. 29).

CITRUS

Citrus Insect Situation in Florida - End of March - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 71 percent of groves (norm 56 percent); 47 percent economic (norm 35 percent). Population still above average and in high range despite March decrease. Little change indicated. Highest districts south, central, and west. TEXAS CITRUS MITE (Eutetranychus banksi) infested 30 percent of groves (norm 32 percent); 9 percent economic (norm 12 percent). Population near normal and in low range. Increase will occur late in April. Highest districts east and central. CITRUS RED MITE (Panonychus citri) infested 37 percent of groves (norm 41 percent); 11 percent economic (norm 16 percent). Population below average and in low range. Important increases expected in scattered areas. Highest districts east, north, and central. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) infested 5 percent of groves; 1 percent economic. Population will remain low and below average. GLOVER SCALE (Lepidosaphes gloverii) infested 79 percent of groves (norm 79 percent); 8 percent economic (norm 22 percent). Population below normal and in moderate range. Slight increase expected. Highest districts east and south. PURPLE SCALE (L. beckii) infested 64 percent of groves (norm 81 percent); 2 percent economic (norm 11 percent). Population below normal and will continue low in all districts. CHAFF SCALE (Parlatoria pergandii) infested 44 percent of groves (norm 70 percent); 2 percent economic (norm 15 percent). Population will continue low and below normal in all districts. YELLOW SCALE (Aonidiella citrina) infested 66 percent of groves (norm 65 percent); 1 percent economic (norm 15 percent). Increase expected, but population will be below normal in most areas. Highest districts west and east. BLACK SCALE (Saissetia oleae) infested 38 percent of groves (norm 28 percent); 15 percent economic (norm 11 percent). Population above normal but will remain low through April. Strong increase will start in mid-May. Highest districts central and east. An ARMORED SCALE (Unaspis citri) infested 15 percent of groves, more than in any prior March. Increase expected. APHIDS infested 5 percent of groves (norm 24 percent); none economic (norm 1 percent). Lowest aphid population for March in 17 years of record. Increase expected, but will be moderate and of short duration. WHITEFLIES below normal abundance. Little change expected. MEALYBUG eggs more abundant than average for March. Feeding stages will be scarce until May. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred)).

CITRUS RED MITE (Panonychus citri) - ARIZONA - General at Yuma, Yuma County; treatments continue. (Ariz. Coop. Sur.).

CITRUS THRIPS (Scirtothrips citri) - ARIZONA - Heavy at Yuma, Yuma County; second treatments being applied. Moderate on most untreated trees in Maricopa County. (Ariz. Coop. Sur.).

SMALL FRUITS

GRAPE LEAF SKELETONIZER (Harrisina americana) - FLORIDA - First adult of season in blacklight trap at Gainesville, Alachua County, April 3. (Mead).

ORNAMENTALS

A SLUG (Veronicella moreleti (Crosse and Fischer)) - TEXAS - Three live specimens collected May 2, 1967, in nursery at Brownsville, Cameron County, by K. Biffle. Det. by W. J. Byas. Additional collections made December 1, 1967, at same nursery and at second site. This is a new United States record. Limited survey conducted to determine density and probable areas of occurrence. Study of specimens indicates possible complex of 3 species involved. Recent collections at Raymondville, Willacy County, determined as V. moreleti and Vaginulus occidentalis. Latter species also taken at McAllen, Hidalgo County. Possible third species taken at Raymondville, McAllen, Edinburg, and San Benito determined as Vaginulus sp. Veronicella moreleti has been intercepted at ports of entry from the Canal Zone, Costa Rica, Honduras, and Mexico. This slug reported as a voracious plant feeder in these areas. Additional detection surveys planned for south Texas and adjacent areas of Mexico. (PPC).

APHIDS - ARIZONA - Heavy on roses, marigolds, and Spanishdagger; severe on photinia, pyracantha, holly, euonymus, and ivy at Tucson, Pima County. (Ariz. Coop. Sur.). CALIFORNIA - Pentalonia nigronervosa adults medium on caladium nursery plants in Sacramento, Sacramento County. (Cal. Coop. Rpt.). ALABAMA - Aphis spiraecola very heavy, several hundred per stem, on lower leaf surface of spirea in Lee County; lady beetle and syrphid fly larvae feeding on aphids. (McQueen). MARYLAND - Longistigma caryae nymphs in colonies of 20-200 on willow oak in University Park, Prince Georges County. (U. Md., Ent. Dept.).

ARMORED SCALES - ALABAMA - Fiorinia theae crawlers heavy and generally more widespread than during past few years on Camellia japonica and Burford holly in State; lighter on C. sasanqua. (McQueen). MARYLAND - Aspidiotus juglansregiae heavy on hemlock planting in Prince Georges County. (U. Md., Ent. Dept.).

A CECIDOMYIID MIDGE (Rhopalomyia lonicera) - CALIFORNIA - Larvae, pupae, and adults present in bud galls in moderate infestation on Lonicera sp. in Glendora, Los Angeles County. (Cal. Coop. Rpt.).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - DELAWARE - Eggs hatched; first larvae and tents found on ornamental crab apple March 31 in Newark area, New Castle County. (MacCreary).

WESTERN FLOWER THRIPS (Frankliniella occidentalis) - ARIZONA - Averaged 10 per flower at Tucson, Pima County. Unusually heavy on unopened buds in Salt River Valley, Maricopa County; discoloration to petals evident. (Ariz. Coop. Sur.).

FOREST AND SHADE TREES

AN ENGRAVER BEETLE (Ips woodi) - NEVADA - Collected July 30, 1965, on Pinus flexilis at Bear Creek Summit at 8,488 feet in Elko County by R. C. Bechtel and P. C. Martinelli. Det. by R. C. Bechtel, confirmed by S. L. Wood. This is a new State record. (Bechtel).

NORTHERN PINE WEEVIL (Pissodes approximatus) - OHIO - Adults active since March 18 in Scioto County; first noted in Trumbull County March 28. (Campbell).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - OHIO - Late pupae very heavy on shoots in block of Scotch pine in Scioto County March 25. (Campbell).

SILVER-SPOTTED TIGER MOTH (Halisidota argentata) - CALIFORNIA - Larvae heavy on conifers at Hillsborough, San Mateo County. (Cal. Coop. Rpt.).

BLACK PINE-LEAF SCALE (Nuculaspis californica) - ILLINOIS - Collected on jack pine at Lisle, Du Page County, March 6, 1968, by W. R. Crowley. Det. by L. J. Stannard. This is a new State reocrd. (Ill. Ins. Rpt.).

PINE TUBE MOTH (Argyrotaenia pinatubana) - OHIO - Controls may be required in 1968 due to increase, especially of second generation in southwestern area. (Cooley).

PINE BARK APHID (Pineus strobi) - WISCONSIN - Moving to base of white pine needles; egg laying begun April 2 in western Dane County. (Wis. Ins. Sur.). OHIO - Egg laying begun in southern area; females and numerous eggs in cottony masses on many white pines in Lawrence County. (Rose).

AN APHID (Eulachnus agilis) - OHIO - Eggs and first and second instars infested some Scotch pine in Coshocton County. (Campbell).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - PENNSYLVANIA - Eggs hatched on wild cherry in Lebanon and Berks Counties April 2 (Simons); larvae light to moderate on wild cherry in Lancaster County (Quakenbush), and light in Bucks County April 4 (Jefferies). MARYLAND - First larvae of season; tents conspicuous on wild cherry in eastern and southern areas. (U. Md., Ent. Dept.). FLORIDA - Full-grown larvae about to pupate; some cocoons evident in Gainesville, Alachua County. (Kuitert).

FOREST TENT CATERPILLAR (Malacosoma disstria) - FLORIDA - Second and third instars more abundant than usual on leaves of various oaks at Gainesville, Alachua County. Det. by L. A. Hetrick. (Hetrick).

ELM LEAF BEETLE (Pyrrhalta luteola) - OKLAHOMA - Adults becoming active on Payne County trees. (Okla. Coop. Sur.). OHIO - Adults emerging from hibernation in Franklin County homes. (Lyon).

EUROPEAN ELM SCALE (Gossyparia spuria) - CALIFORNIA - Heavy on elm nursery stock at Madera, Madera County. (Cal. Coop. Rpt.). NEW MEXICO - Heavy on young American elm stock at nursery in Valencia County. (Heninger).

MAN AND ANIMALS

MOSQUITOES - DELAWARE - Aedes canadensis first and second instars abundant in New Castle County; high adult populations predicted for late April and May. (Lake). FLORIDA - No reports of Mansonia perturbans this year at Gainesville; nuisance in late March last year. (Mead). ALABAMA - Mosquitoes numerous and annoying statewide, especially around homes in Lee County. Larvae numerous in containers of stagnant water; adults should increase greatly in few days. (McQueen). WISCONSIN - Culex pipiens pipiens female taken in Mazomanie blacklight trap. (Wis. Ins. Sur.).

SCREW-WORM (*Cochliomyia hominivorax*) - Total of 7 cases reported in U.S. March 31-April 6 as follows: TEXAS - Kenedy 1, Hidalgo 1, Starr 1; CALIFORNIA - Imperial 4. Total of 139 cases reported in portion of Barrier Zone in Republic of Mexico as follows: Baja California 1, Territorio sur de Baja California 4, Sonora 84, Chihuahua 2, Coahuila 3, Nuevo Leon 2, Tamaulipas 43. Total of 27 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 3,080,000; California 1,100,000; and Mexico 102,136,000. (Anim. Health Div.).

CATTLE GRUBS (*Hypoderma* spp.) - NORTH DAKOTA - Ranged 1-12 (average 4) per back on 16 percent of beef cattle examined at Dickinson livestock auction February 22. Ranged 1-43 (average 7.9) per animal on 39 percent of animals at Dickinson and Mandan auctions March 12-28. Larval counts same as in 1967 at these locations; percent infested animals decreased from 59 to 39 percent from last year. Decrease probably due to increased systemic control treatments on calves. Larvae light (1-10) on 70 percent, medium (11-20) on 20 percent, and heavy (over 20) on 8 percent of infested animals; 94 percent *H. lineatum* and 6 percent *H. bovis*. (Brandvik). OKLAHOMA - *H. lineatum* light; annoying Osage County cattle. (Okla. Coop. Sur.).

HORN FLY (*Haematobia irritans*) - TEXAS - Ranged 10-500 (average 50) per head on Brazoria County cattle. (Sanders, Mar. 29). OKLAHOMA - Up to 250 per head (average 25-40) in south-central, central, and north-central areas. (Okla. Coop. Sur.). MISSISSIPPI - Ranged 2-3 on some Oktibbeha County bee cattle. (Dinkins).

FACE FLY (*Musca autumnalis*) - MARYLAND - First adults of season March 29 on cattle at Beltsville, Prince Georges County. (U. Md., Ent. Dept.).

STABLE FLY (*Stomoxys calcitrans*) - OKLAHOMA - Ranged up to 10-12 per head on cattle in scattered areas of Payne County. (Okla. Coop. Sur.).

CATTLE LICE - OKLAHOMA - *Linognathus vituli* and *Haematopinus eurysternus* heavy on cattle in Washita and Mayes Counties; 3 per part in Payne County. Few *Bovicola bovis* noted. (Okla. Coop. Sur.).

ROCKY MOUNTAIN WOOD TICK (*Dermacentor andersoni*) - COLORADO - Present in Rist and Poudre Canyons, Larimer County. (Thatcher). WYOMING - Active in Laramie County. (Parshall). NORTH DAKOTA - Adults heavy, 3 per 6-inch square, on single cow at Dickinson March 14. (Brandvik).

LONE STAR TICK (*Amblyomma americanum*) - OKLAHOMA - Averaged less than 2 per drag in Muskogee and Cherokee Counties; increased on cattle and deer. (Okla. Coop. Sur.).

BROWN RECLUSE SPIDER (*Loxosceles reclusa*) - INDIANA - Male collected in office at Jeffersonville, Clark County. Det. by T. A. Parker. This is a new county record. (Huber). MISSOURI - Collected from Greene and Polk Counties December 12, 1967, and April 1, 1968, by J. E. Francka. Polk County is a new county record. (Munson).

A SCORPION (*Centruroides vittatus*) - COLORADO - Found in Las Animas County home. (Hantsbarger).

HOUSEHOLDS AND STRUCTURES

BROWN COCKROACH (*Periplaneta brunnea*) - NORTH CAROLINA - Collected in house in Wake County February 22, 1968, by C.G. Wright. Det. by A.B. Gurney. Large numbers present in crawl area, in kitchen cabinets, inside back panels of chest of drawers, and in closets. This is first report of established infestation in State. Only previous record is single female collected at Asheville in 1897. (Wright).

MISCELLANEOUS WILD PLANTS

PAINTED LADY (Vanessa cardui) - ARIZONA - Heavy migrations through Tucson area, Pima County (Curtis); larvae feeding extensively on Malva parviflora in northwest Phoenix area, Maricopa County. (Ariz. Coop. Sur.).

STORED PRODUCTS

A DERMESTID BEETLE (Trogoderma parabile) - NORTH DAKOTA - Larvae collected from stored barley seed at Fargo, Cass County, August 1, 1967. Det. by J. M. Kingsolver. This is a new State record. (Brandvik).

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - CALIFORNIA - Adults heavy in tulip seed pods at Willows, Glenn County. (Cal. Coop. Rpt.).

BENEFICIAL INSECTS

LADY BEETLES - ARIZONA - Hippodamia convergens averaged 20 per 100 sweeps in alfalfa and heavy on sweetpotato slips in Laveen area, Maricopa County; adults and larvae equally numerous. (Ariz. Coop. Sur.). NEW MEXICO - Unspecified adults abundant in Valencia County alfalfa; apparently holding pea aphid population at low level. (Heninger). UTAH - Adults active in Logan and Millville area, Cache County. (Knowlton). ARKANSAS - First Coleomegilla maculata adult of season collected in northwest area alfalfa. (Boyer). VIRGINIA - H. convergens active in small alfalfa field at Charlotte County courthouse (Hendrick, Mar. 28).

HONEY BEE (Apis mellifera) - OHIO - Honey production in 1967 totaled 1,639,000 pounds, 73 percent below 6,109,000 pounds produced in 1966. Yield per colony was 11 pounds, 73 percent below 41 pounds of 1967. This is lowest yield for State since 1940. This lower yield is partially due to cool, damp spring, dry summer, and excessive swarming early in year. Favorable fall weather allowed colonies to store for wintering, but permitted little honey to be taken off. Colonies remained same as in 1966 at 149,000. Honey available for sale on December 15, 1967, was 443,000 pounds, down 74 percent from a year ago. Value of honey and beeswax in 1967 was $344,000 or 28 percent of last year's $1,230,000. (Rose). ALABAMA - Large flights daily statewide. (McQueen). UTAH - Winter mortality of 15 colonies in 3 yards of 65 colonies each in Erda area, Tooele County. (Knowlton).

HYMENOPTEROUS PARASITES - ARKANSAS - Mostly braconids ranged 100-200 per 100 sweeps in alfalfa and small grain in northwest area. Parasitism of aphids especially heavy in small grain. (Boyer).

A PHYCITID MOTH (Laetilia zamacrella) - CALIFORNIA - Larvae moderate locally on Monterey pine at Oakland, Alameda County. (Cal. Coop. Rpt.).

A GREEN LACEWING (Chrysopa sp.) - ARKANSAS - First adult of season on northwest area wheat. (Boyer).

BIG-EYED BUGS (Geocoris spp.) - TEXAS - Found on lawn at Del Rio, Val Verde County. (Tatum, Mar. 29). VIRGINIA - Active in small alfalfa field at Charlotte County courthouse. (Hendrick, Mar. 28).

A DAMSEL BUG (Nabis sp.) - VIRGINIA - Active in small alfalfa field at Charlotte County courthouse. (Hendrick, Mar. 28).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Larvae infested grapefruit on several trees in grove between Ft. Pierce and White City, St. Lucie County. (King, Mar. 18).

CEREAL LEAF BEETLE (*Oulema melanopus*) - OHIO - First adult of season in Defiance County March 20. (Maxwell et al.).

GRASSHOPPERS - COLORADO - First instars emerged in alfalfa north and east of Loveland, Larimer County. (Kamal).

HALL SCALE (*Nilotaspis halli*) - CALIFORNIA - Infestation discovered on small Klamath plum seedling (*Prunus subcordata*) in Stilson Canyon, Butte County, for a new host record. (Cal. Coop. Rpt.). This is third spot occurrence of Hall scale in same area since formal program concluded in 1960. (PPC).

RANGE CATERPILLAR (*Hemileuca oliviae*) - NEW MEXICO - Egg mass survey conducted March 26. Total of 10 egg masses found in 26 stops in Colfax County and one egg mass found in 60 stops in Union County. (Finnie).

WHITE-FRINGED BEETLES (*Graphognathus* spp.) - MISSISSIPPI - Larvae damaged arrow leaf clover stand in Jeff Davis County. (Dinkins).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville - 4/1-4, 2BL - Armyworm (*Pseudaletia unipuncta*) 7, beet armyworm (*Spodoptera exigua*) 1, black cutworm (*Agrotis ipsilon*) 5, granulate cutworm (*Feltia subterranea*) 84, salt-marsh caterpillar (*Estigmene acrea*) 3, tobacco budworm (*Heliothis virescens*) 1, yellow-striped armyworm (*Prodenia ornithogalli*) 7. Sanford - 3/25-31, BL - Armyworm 5, black cutworm 10, cabbage looper (*Trichoplusia ni*) 6, corn earworm (*H. zea*) 1, fall armyworm (*S. frugiperda*) 1, granulate cutworm 57, yellow-striped armyworm 1. Mississippi - Stoneville - 3/30-4/5, 2BL, 40-77°F., precip. 1.62 - Armyworm 102, black cutworm 6, granulate cutworm 1, salt-marsh caterpillar 5, variegated cutworm (*Peridroma saucia*) 59, yellow-striped armyworm 2. TEXAS - Waco - 3/30-4/5, BL - Armyworm 398, beet armyworm 9, black cutworm 8, cabbage looper 1, corn earworm 6, granulate cutworm 12, salt-marsh caterpillar 3, variegated cutworm 160, yellow-striped armyworm 1.

CORRECTIONS

CEIR 18(11):198 - CITRUS - Paragraph 1, line 8: Another LEAF ROLLER MOTH (Xylomyges curialis)...should read *A NOCTUID MOTH* (Xylomyges curialis)...

CEIR 18(12):208 and 212 - A TORTRICID MOTH (Cacaecimorpha pronubana) should read (Cac*o*ecimorpha pronubana).

CEIR 18(13):239 - FACE FLY (Musca autumnalis) for NEVADA should read *HOUSE* FLY (Musca *domestica*).

HAWAII INSECT REPORT

Fruits - Total of 6 more STINK BUG (Plautia stali) adults collected at lights in Nuuanu and Salt Lake areas, on black nightshade at Pearl City, and in light trap at Animal Quarantine Station at Honolulu, Oahu. Other hosts include peach, persimmon, plum, cherry, grape, and pear. (Mitchell).

Turf, Pasture - Larvae and adults of a GRASS WEBWORM (Herpetogramma licarsisalis) decreased from medium-heavy to light in Kikuyu grass pastures at Kipahulu, Maui; larvae 5-7 per square yard and adults up to 5 per 100 square yards in spots. Adults medium but larvae absent in scattered areas of pasture at Hana. Larvae remain heavy in some lawns at Hawaii Kai, Kailua, Waimanalo, Halawa, and Mokuleia, Oahu; adults heavy on various grasses and weeds in scattered areas. Larvae heavy and damage severe on Hilo grass at Hakalau, Hawaii Island. (Miyahira et al.). Adults of a BILLBUG (Sphenophorus venatus vestitus) trace in Kikuyu grass pastures at Kipahulu, Maui, at 400 feet elevation. Adults light, 10-15 per square yard, on zoysia lawns at Makawao, at 1,600 feet elevation. Larvae negative in both areas. (Miyahira).

Vegetables - CARMINE SPIDER MITE (Tetranychus telarius) built up on snap beans, watermelon, and eggplant at Waianae, Oahu. (Yamamoto). BEAN CAPSID (Pycnoderes quadrimaculatus) adults heavy, up to 40 per leaf, in 0.25 acre of untreated squash at Ewa, Oahu. (Funasaki).

Ornamentals - Adults of a LEAFHOPPER (Protalebrella brasiliensis) medium, up to 15 per sweep, on wedelia at Kaneohe, Koko Head, Kahaluu, and scattered areas of Honolulu, Oahu. (Greenwell et al.).

Man and Animals - Total of 1,717 Aedes vexans nocturnus and 3,634 Culex pipiens quinquefasciatus taken in 49 light traps on Oahu during March. A. vexans higher than normal at Punaluu and C. pipiens quinquefasciatus highest at Kailua. (Mosq. Cont. Br., Dept. of Health).

Beneficial Insects - All stages of a LADY BEETLE (Cryptolaemus montrouzieri) heavy on several monkeypod trees at Ala Moana Shopping Center in Honolulu, Oahu. Numerous larvae descending trunks to pupate in debris at tree base. Citrus mealybug (Planococcus citri) light on foliage. (Au).

Miscellaneous Pests - GIANT AFRICAN SNAIL (Achatina fulica) heavy and active in wild areas at Hana, Maui. (Ah Sam).

INSECT DETECTION

CONVOLVULUS HAWK MOTH (*Agrius convolvuli*) - CALIFORNIA - Adult collected in blacklight trap at Travis Air Force Base at Fairfield, Solano County, by F. R. Larsen. Det. by W. D. Field. This is first collection in North America. This species is widespread in Middle East, Asia, and Europe. This is a pest of bindweed (wild morning-glory) primarily, but is known to seriously damage sweetpotato plants, and according to literature, bean and portulaca. Additional survey will be made as this species is known to have 3-4 generations a year. No larvae have been found and this is not considered an established infestation at present. (Cal. Coop. Rpt.).

A LEAFHOPPER (*Allygus provincialis*) - NEW JERSEY - Single male taken in blacklight trap at Hoboken, Hudson County, July 24, 1964. Det. by J. P. Kramer. (Race). As far as can be determined, this European leaf hopper has no known economic importance, having been recorded from uncultivated plants. It is not known if this species is established. (PPC).

New United States Record

A SLUG (*Veronicella moreleti* (Crosse and Fischer)) - TEXAS - Three live specimens collected in nursery at Brownsville, Cameron County, May 2, 1967, by K. Biffle. Det. by W. J. Byas. This species has been intercepted at ports of entry from the Canal Zone, Costa Rica, Honduras, and Mexico. Reported as a voracious plant feeder in these areas. (PPC). (p. 279).

New State Records

A LYGAEID BUG (*Sphragisticus nebulosus*) - DELAWARE - Adult collected in lima beans in Overbrook, Sussex County, July 21, 1964, by P. P. Burbutis and L. P. Kelsey. Det. by J. L. Herring. (p. 276).

AN ENGRAVER BEETLE (*Ips woodi*) - NEVADA - Collected July 30, 1965, on *Pinus flexilis* at Bear Creek Summit in Elko County by R. C. Bechtel and P. C. Martinelli. Det. by R. C. Bechtel, confirmed by S. L. Wood. (p. 280).

BLACK PINE-LEAF SCALE (*Nuculaspis californica*) - ILLINOIS - Collected on jack pine at Lisle, Du Page County, March 6, 1968, by W. R. Crowley. Det. by L. J. Stannard. (p. 280).

BROWN COCKROACH (*Periplaneta brunnea*) - NORTH CAROLINA - Established infestation reported in house in Wake County February 22, 1968. Collected by C. G. Wright. Det. by A. B. Gurney. (p. 281).

A DERMESTID BEETLE (*Trogoderma parabile*) - NORTH DAKOTA - Larvae collected from stored barley seed at Fargo, Cass County, August 1, 1967. Det. by J. M. Kingsolver. (p. 282).

New County Records

ALFALFA WEEVIL (*Hypera postica*) - ARKANSAS - Hempstead County. (p. 275).

BROWN RECLUSE SPIDER (*Loxosceles reclusa*) - INDIANA - Clark County. MISSOURI - Polk County. (p. 281).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1967

(continued from page 270)

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

BOLL WEEVIL (Anthonomus grandis) was of little economic importance in the High Plains and Trans-Pecos areas of TEXAS. No specimens were found during a survey in the El Paso area in June. One field was found positive out of 5 properties surveyed in Glasscock County. The first boll weevil of the season was found in June near Girard, Kent County. Infested fields were found in Dickens, Garza, Hall, Kent, and Motley Counties during a survey in July with the heaviest concentrations in Dickens and Kent Counties. A survey above the Caprock was negative in July. No weevils were found in the El Paso section where infestations were present in 1966. Positive finds were made in the Whiteflat and Flomont area of Motley County, in northern Garza County, and in the Justiceburg area in August. Two fields were found infested within the city limits of El Paso and one positive find was made in Presidio County during the month. Several finds were made above the Caprock in the East Plains section. During early November pupae and larvae were found on infested properties inside the El Paso city limits. Collection of a specimen in Gray County was confirmed in December. This is the most northwestern collection in the State. A total of 19,759 aggregate acres were treated in the Big Bend area and 501,024 aggregate acres were treated in the High Plains. See page 287 for effect of treatment program.

BOLL WEEVIL COMPLEX (Anthonomus grandis complex) detection surveys were conducted during the summer in the cotton-growing areas of NEW MEXICO with negative results. Two heavy infestations were found in the Arva Valley of Pima County, ARIZONA, during December. In CALIFORNIA, a single collection of 3 larvae was taken in a field at Indio, Riverside County, on October 27, 1967.

BROWN-TAIL MOTH (Nygmia phaeorrhoea) infestations occurred during late May in the Casco Bay region of MAINE. Heavy populations caused moderate damage on Outer Brothers, Cow, and House Islands. Infestation was very light on Cushing Island. Populations were low on the mainland at Falmouth Foreside. These infestations were treated.

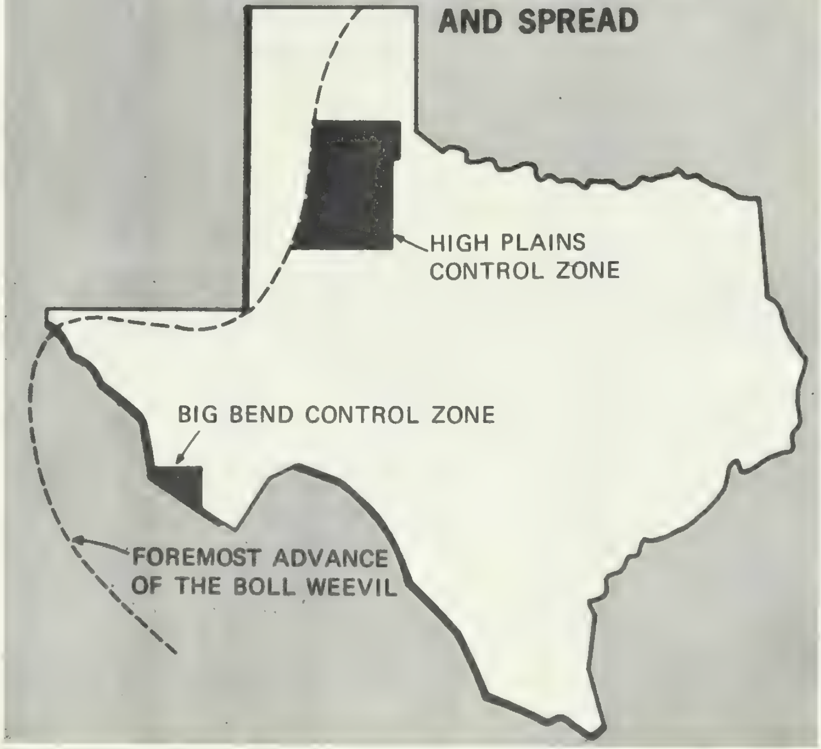
CARIBBEAN FRUIT FLY (Anastrepha suspensa) was reported for the first time in Osceola, Pasco, Lake, Seminole, and Volusia Counties, FLORIDA, during 1967. Infested counties now total 28, all in the lower half to two-thirds of the peninsula. During 1967 several new hosts were added to the already lengthy host list. Total flies trapped in 1967 increased over 1966. Flies captured from March through December in 1966 totaled 94,904 and in 1967 totaled 256,122. May was the peak month for adult captures. Caribbean fruit fly remained a serious pest of dooryard fruits, including certain types of citrus, but did not become a problem on commercial citrus.

CEREAL LEAF BEETLE (Oulema melanopus) was found for the first time in PENNSYLVANIA, June 7, 1967, in Lawrence County, and later in the month in Butler, Beaver, and Mercer Counties. It is very light in a known area of approximately 200 square miles; no damage to oats was noticed. The regulated area in OHIO was extended in June to include all of the State. Although larval populations on oats and wheat were low in the northwestern area this year, numbers have definitely increased. A survey of 27 wheat fields and 2 oat fields was conducted in Williams County in northwestern Ohio. Larvae taken per field ranged 0-54 per 100 sweeps (average 7.1) for all fields. Adults ranged 0-4 per 100 sweeps and averaged 0.52. By the second week of June, larval development was nearly completed in the central section. Although populations were not generally large enough this year to justify treatment, reports of moderate infestations in Williams and Defiance Counties in the northwestern section of the State indicate that infestations there may justify treatment of some oat fields in 1968. Adult activity, including egg laying, was well underway by April 28 in MICHIGAN. Cool weather, during May delayed development to the point where life cycle conditions for the remainder of the season were similar to those recorded for 1966. There

EFFECT OF BOLL WEEVIL TREATMENT PROGRAM

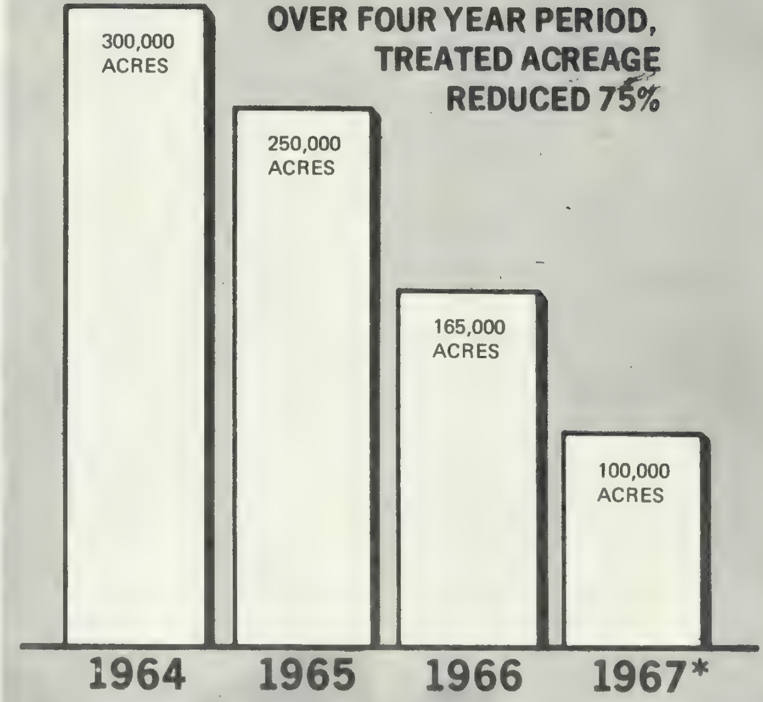
TREATMENT AREA

USDA AND GROWERS SHARE EQUAL COST FOR TREATMENT TO PREVENT BUILDUP AND SPREAD



PRESENT STATUS

OVER FOUR YEAR PERIOD, TREATED ACREAGE REDUCED 75%



**Overwintering population reduced 99%*

AGRICULTURAL RESEARCH SERVICE

U. S. DEPARTMENT OF AGRICULTURE

was no cooperative spray program during 1967 comparable with the 1963 to 1966 suppression programs. Since this species is present throughout the Lower Peninsula, the only feasible means of control is by sprays applied by individual growers. An estimated 7,900 acres of small grains were privately sprayed for control of this pest. Over 95 percent of this was to oats. Counties and approximate acreage sprayed in each are as follows: Berrien 800, Cass 800, Van Buren 700, Kalamazoo 700, Calhoun 700, St. Joseph 500, Jackson 500, Washtenaw 500, Branch 400, Shiawassee 400, Allegan 300, Livingston 200, Ingham 200, Hillsdale 200, Lenawee 100, Wayne 100, Barry 100, Clinton 100, Eaton 100; all others 500.

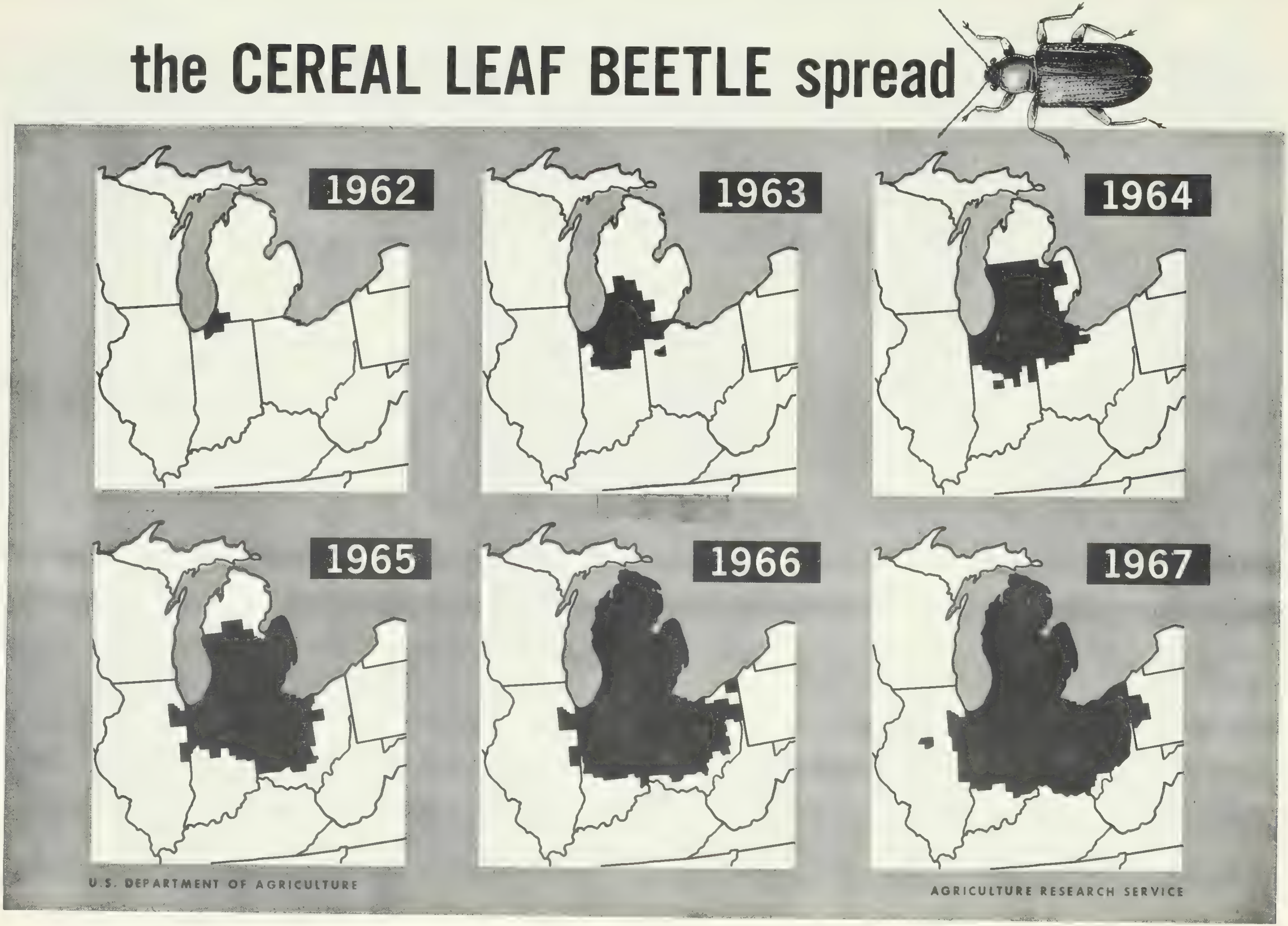
Cereal leaf beetle was found for the first time in Bartholomew, Decatur, Clay, Hamilton, Jennings, Owen, Ripley, Vermillion, and Vigo Counties, INDIANA, in 1967. During mid-June in the New Carlisle area of La Porte and St. Joseph Counties, peak larval densities of 4-7 per stem infested oats. During early July adult emergence reached a peak. For the first time, economic infestations were present outside the New Carlisle area. Economically damaging larval populations infested oats during mid-June in northern La Porte County (1-2 per stem), northern Marshall County (6 per 10 stems to 1 per stem), southern Elkhart County (1-3 per stem), the northern half of Kosciusko County (6-8 per 10 stems), and western Noble County (8 per 10 stems to 2 per stem). Economic infestations on oats are expected to be prevalent in the north-central and northeastern districts during 1968. Cereal leaf beetle larvae were found for the first time in Woodford, Edgar, and Iroquois Counties, ILLINOIS, in June. Treatments were made to eradicate these infestations. A total of 74,879 acres was treated in Vermilion, Kankakee, and Will Counties early in the season. Approximately 500 small grain fields were inspected in 41 counties in MISSOURI with negative results. Cereal leaf beetle was not found in IOWA and surveys June 12-16 revealed no signs of this pest in WISCONSIN. See page 289 for spread of cereal leaf beetle.

A CHERRY FRUIT FLY (*Rhagoletis cingulata indifferens*) infested fruit on 23 trees on 7 properties in Hilts, Klamath River, and Etna, Siskiyou County, CALIFORNIA. These and adjacent trees and hosts were treated. Survey in the other northern counties was negative.

CITRUS BLACKFLY (*Aleurocanthus woglumi*) is not known to occur in the United States. During fiscal year 1967, intensive surveys were made in those TEXAS counties in the lower Rio Grande Valley which produce commercial citrus. Limited surveys were made in counties with noncommercial citrus. Because of the finding of citrus blackfly infestations in Matamoros, Mexico, in May and June 1966, a thorough check was made in 1967 throughout the city of Brownsville. Special attention was given again to the inspection of citrus trees near ports of entry and along highways leading from Mexico. A tree-by-tree inspection was made on all the properties found infested in 1955-1956 and their environs, but no specimens were detected.

As an aid in keeping this species from gaining a foothold in this country, a chemical control zone is maintained from the Rio Grande southward for 100 miles into Mexico. Survey was conducted in eastern and western Mexico on 14,255 properties. Approximately 700,000 trees were examined. A total of 946 of these trees were found infested on 72 properties. When infestations were found, infested trees and the margins around them were sprayed with carbophenathion. Spraying of 117,633 trees accomplished the desired goal of holding this pest in check. Three sprayings are required for complete control.

CITRUS WHITEFLY (*Dialeurodes citri*) eradication measures were applied to current and new infestations in CALIFORNIA. This was reduced to a holding effort in the Sacramento County area. Survey and detection was continued throughout the year. At Sacramento, Sacramento County, and at San Diego, San Diego County, several hundred city blocks were infested and additional finds were made during the year. A new infested area of 5 city blocks in Bakersfield, Kern County, received double treatment and survey. Infestation at Fresno, Fresno County, was treated and surveyed. No live whiteflies were found in 1967.


the CEREAL LEAF BEETLE spread
1962
1963
1964
1965
1966
1967
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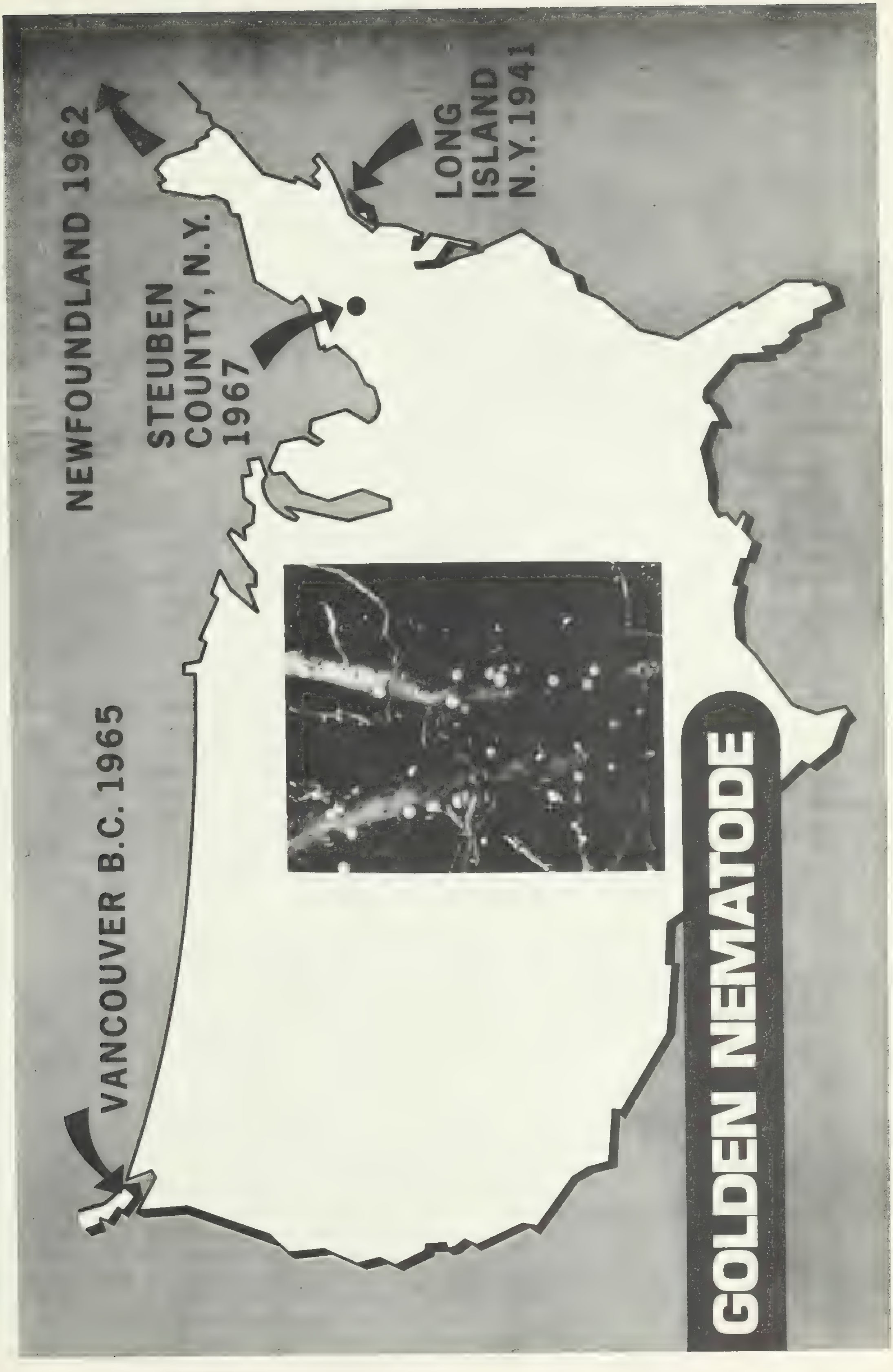
EUROPEAN CHAFER (Amphimallon majalis) was found for the first time in Tioga County, NEW YORK; Union County, NEW JERSEY; and Carbon, Lackawanna, and Lycoming Counties, PENNSYLVANIA, during 1967. First flights of the season were observed June 12 in Allentown, Pennsylvania, and Newark, New York. Previously found in OHIO only in Cuyahoga County, European chafer was found for the first time in Ashtabula County in the northeastern district of the State on June 26. Adults began to emerge in Cuyahoga County on June 13 and adult flight continued to July.

GOLDEN NEMATODE (Heterodera rostochiensis) was reported for the first time from Steuben County, NEW YORK, on December 4, 1967. The positive cysts were recovered from soil samples collected from one field during routine soil survey operations by PPC personnel during October. This marked the first time that an established infestation of golden nematode was found in the continental United States beyond Long Island. The involved field is located near the town of Prattsburg and is one of many in the area operated by former Long Island potato growers. Appropriate regulatory action has been taken to prevent spread of the nematode with infested potatoes. Although survey findings proved negative for all other fields sampled in the Upstate New York area, a more comprehensive operation is planned and will be conducted during the spring months of 1968. In New York, 41,398 acres were surveyed, 49,753 samples were collected, and 279 acres were found infested, 55 of which were in Steuben County. Six treated fields on Long Island were found reinfested, while 12 fields there were found infested for the first time. Surveys were conducted in 21 additional States during 1967. No golden nematode cysts were found. See page 291 for status of golden nematode.

GRASSHOPPERS became active in WISCONSIN by May 26 when some Melanoplus spp. nymphs were found in the sandy areas near Spring Green. M. sanguinipes fourth instars were in this area by June 23 and adults were feeding in marginal rows of corn by August 4. First instars of M. femurrubrum appeared in alfalfa about June 23, second instars by July 7, fourth instars by July 21, fifth instars by July 28, and adults by August 18. Grasshopper populations increased in several areas of MINNESOTA in 1967. The earliest hatch of any species was the first week of June. Egg hatch of M. femurrubrum, the dominant species in the State, peaked about mid-July. Scattered and localized economic populations occurred in several counties. Very abundant infestations occurred mostly in central Minnesota, in parts of Sherburne, Stearns, Morrison, Todd, and Crow Wing Counties. Small areas of very abundant infestations also occurred in east-central, southeastern, and southwestern counties. Moderate numbers were most frequent in west-central and central counties. The principal crop affected was alfalfa in the northern Red River Valley. Most crop damage was restricted to field margins adjacent to infested areas. M. femurrubrum continued to dominate all areas. A limited egg survey in October showed that 73 percent of the fields checked had eggs present and that the number per square foot was higher than in the past several years. Grasshopper populations are expected to be higher than in in 1967, especially in central Minnesota, unless weather is unfavorable.

A cold, late spring reduced the grasshopper threat in NORTH DAKOTA. A light hatch began May 22-28 and continued until late July. Economic but marginal nymphal populations were evident by late June, but they had not moved out of the hatching areas. After the first crop of alfalfa hay was cut, grasshoppers moved into cropland. Late crops received the most damage and controls were necessary in several areas. Infestations were threatening to severe in several south-central and southeast counties and a small north-central area of the State. Melanoplus differentialis, M. bivittatus, and M. femurrubrum were dominant cropland species. No rangeland or roadside control programs were necessary this season. The cool, wet weather during the spring and early summer of 1967 held back the grasshopper egg hatch until mid-May in southern SOUTH DAKOTA. Mid-July surveys showed populations to be high at numerous locations in south-central and western areas. Infestations were heaviest in weedy areas, roadsides, field margins, and in alfalfa. Field counts ranged 20-30 (up to 75) per square yard in alfalfa fields. Counts in roadsides and field margins ranged 20-50 per square yard. M. differentialis was dominant in Tripp County, M. bivittatus in Aurora,



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Jerauld, Sanborn, and Beadle Counties. *M. sanguinipes* and *M. femurrubrum* occurred in most areas. Populations ranged 10-25 per square yard in the western areas and some controls were applied. Grasshoppers damaged corn and small grains when they moved out of alfalfa. By late July and early August grasshoppers had become more of a threat in a number of areas of South Dakota. Controls were applied in corn and sorghum in Haakon County, oats and wheat in Pennington County, and to 2,000 acres of cropland in Sanborn County. Grasshoppers ranged up to 50 per square yard in southwestern Sanborn County and western Davison County, with 30 per square yard common. Alfalfa, corn, roadsides, and field margins were the main habitats. Controls undertaken by individual growers were continued through early October. The fall adult survey showed infestations of varying degrees over two-thirds of the State with the heaviest and most extensive being in the southeast. Other heavily infested areas were southern Tripp and southwestern Gregory Counties, most of the Cheyenne River area, and smaller areas in Meade, Haakon, Ziebach, Dewey, and Corson Counties. Infestations were light to threatening over one-half of the State with the lowest counts in the northern part. *M. differentialis*, *M. femurrubrum*, *M. bivittatus*, and *M. sanguinipes* were the dominant species with *M. differentialis* dominant in the heavily infested areas. Light to severe infestations can be expected in 1968 in those areas of South Dakota where adult populations were light to heavy in the fall of 1967. Weather during the spring and early summer will be a prime factor in determining the severity in 1968.

Grasshoppers were economic over most of NEBRASKA except in the east and southeast. Severe infestations were scattered in the western two-thirds of the State. On crops in the north and northeast, *Melanoplus femurrubrum*, *M. differentialis*, and *M. bivittatus* were dominant. On rangeland in the west, *Aulocara elliotti*, *Ageneotettix deorum*, *Phlibostroma quadrimaculatum*, *Trachyrhachys kiowa*, *Amphitornus coloradus*, and *Pardalophora haldemanii* predominated. On crops in the panhandle area, *M. differentialis* and *M. bivittatus* required the replanting of 20,000 acres of wheat. If conditions are favorable in the spring, severe infestations may result. Grasshoppers caused concern in a few areas of southeast and southwest KANSAS in July and August and many growers applied controls. Grasshoppers also caused much concern as wheat field margins were damaged in southeast, south-central, and southwest Kansas during the fall. Controls were applied to field margins. *Melanoplus* spp. were light in MISSOURI in 1967 and caused no economic damage to field crops. The fall survey indicated populations were noneconomic to light throughout the State. Grasshoppers damaged rangeland in many OKLAHOMA areas. Survey showed rangeland in 19 counties economically infested with 8 or more adults per square yard. Populations were economic in northwest, southwest, and south-central areas. Moderate to threatening numbers infested crop margins and roadsides in these areas. Light adult numbers, 3-7 per square yard, were widespread in the western half of the State.

Totals of 111,003 acres in Lea County and 489,338 acres in Lincoln County were treated in NEW MEXICO. Adult surveys during August and September indicated 5,437,000 acres of rangeland and 122,000 acres of cropland with moderate or more intense infestations. Grasshopper populations increased to economic levels in eastern and southeastern COLORADO. Growers treated the borders of cropland in some areas, but grassland was not treated. In eastern Colorado, controls were required in the borders of fall-planted wheat. Populations were low in UTAH and damage to corn unusually light. Damage to small grains was the lightest in many seasons and range damage the lowest in more than 20 years. Damage was very light to small fruits in Utah. Grasshopper populations in NEVADA were below the 1966 level, which was the lowest in several years. Only small, localized acreages were treated. A generally late hatch and high nymphal mortality occurred in some areas. Surveys indicated 49,180 acres of rangeland and 850 acres of cropland were infested, with 48,400 acres located in Humboldt and Pershing Counties.

Grasshopper populations increased and were damaging in some areas of CALIFORNIA during 1967. There were no organized control programs as most populations were controlled by individual growers. Most infestations occurred locally on pastures and rangelands in 14 counties throughout the State. Some damage occurred on wheatgrass plantings in Lassen County. Fruit, vegetables, and field crops were damaged in Amador, Merced, Stanislaus, Riverside, Yuba, and Solano Counties. Adult counts of Melanoplus sanguinipes and Camnula pellucida ranged 2-9 per square yard on rangeland in OREGON during July with some damage to vegetable and flower gardens. Grasshoppers caused moderate to heavy damage to grass in Clark and Skamania Counties, WASHINGTON, during August. First to fourth instars of Oedaleonotus enigma, Aulocara elliotti, and Melanoplus sanguinipes appeared in IDAHO during the first half of August in areas where adults usually appeared by this time. Although development was 4-6 weeks later than usual at higher elevations, most grasshoppers matured and laid eggs. Populations in MONTANA during 1967 were the lowest since 1900 in the State, but counts were high in a few areas. Grasshoppers caused little damage to rangeland because of excellent range conditions. Some fall wheat was treated along the Toole and Richland County line.

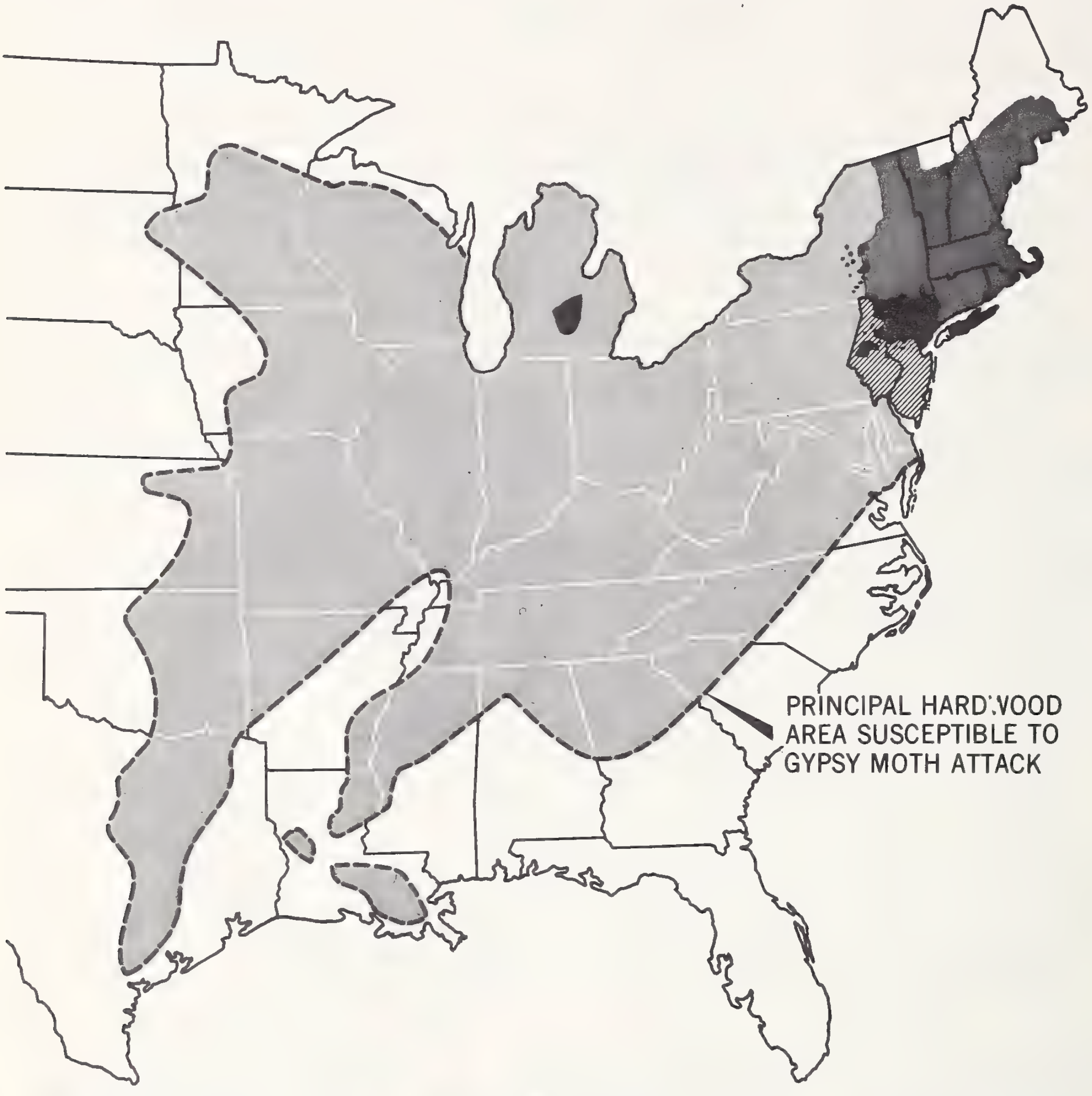
GYPSY MOTH (Porthetria dispar) populations remained low in VERMONT. Defoliation occurred on only 2 acres at Milton, Chittenden County. Infestations were heavier than usual in RHODE ISLAND. The first egg hatch in Johnston, Providence County, was noted May 8 and early development was slow. Gypsy moth infestations increased in PENNSYLVANIA and, by the end of the summer, specimens of the pest were found at 249 sites in 12 eastern counties. The most heavily infested site was in Berks County where an estimated 50,000 egg clusters occurred in a square-mile area. Eradication treatments were applied to approximately 17,000 acres in the Duck Lake area of Calhoun County, MICHIGAN, during May and June. Two sprays were made over the total acreage and four times over a 50-acre "core" area. This eradication program was followed with a trapping program during the summer. Approximately 1,200 traps baited with natural sex lure were set in a 196-square-mile area of Calhoun, Eaton, and Jackson Counties during mid-July. Traps were rebaited during early August. No male gypsy moths were taken during the season. Trapping programs during the next few years will be needed to determine if this pest has been eradicated from Michigan. See page 294 for status of gypsy moth.

IMPORTED FIRE ANT (Solenopsis saevissima richteri) caused more concern and confusion among farm operators and farm laborers than ever before in ALABAMA. Infestations were found for the first time in Cherokee, Marshall, and Winston Counties. Imported fire ant now occurs in all except four counties in the State: Lauderdale, Colbert, Jackson, and De Kalb. Extensions of infested areas were found in southeast ARKANSAS but no new counties were found infested during 1967. Imported fire ant reinfested Marion County, FLORIDA, during 1967 and Brevard, Charlotte, Columbia, De Soto, Dixie, Hamilton, Highlands, Madison, Suwannee, and Taylor Counties were found infested for the first time during the year. The ant was also found for the first time in Atkinson, Walton, and Wayne Counties, GEORGIA. Local spread occurred in a number of counties. Over 3 million acres were treated. In addition, package mirex bait was distributed for use by individuals where no organized control was underway. In LOUISIANA only Claiborne Parish remains free of imported fire ant. Farmers in at least 27 parishes applied insecticide bait to their properties. Schoolgrounds and other public sites were treated in seven parishes. Mirex bait was used to treat almost 1.5 million acres in northwest Louisiana. Small acreages were treated in interior parishes. In MISSISSIPPI an infestation was found in Washington County for the first time in two years, while extensions to infestations were reported in other counties of the State. Union and Yalobusha Counties were found infested for the first time.

In NORTH CAROLINA, Columbus County was found infested for the first time. In this State eradication treatments are applied as soon as infestations are reported. Several extensions of infested areas were found in Brunswick, Craven, and Columbus Counties. In SOUTH CAROLINA extensions of the infested area were found in the Columbia and Dentsville areas of Richland County. Several minor extensions were found in Aiken County. Ground equipment was used to treat minor infestations in Aiken and Richland Counties. First application was completed in Beaufort, Hampton, Horry, and Jasper Counties. In TENNESSEE surface treatment was made along highway rights-of-way in Giles and Lincoln Counties, and 29,795 acres were treated with mirex bait in these counties. Survey in the State was negative. In TEXAS, Kendall, Houston, Guadalupe, Tarrant, Comal, San Jacinto,

Status of Gypsy Moth Infestation

PRIOR TO AND FOLLOWING 1956-58 ERADICATION PROGRAM



- ■ INFESTED AREA NOT TREATED IN 1956-1958 ERADICATION PROGRAM
- ■ AREA TREATED WITH DDT 1956-1958 (4,096,460 ACRES)
- ▨ SPREAD SINCE CESSATION OF DDT ERADICATION PROGRAM

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and Grimes Counties were found infested for the first time. Minor extensions occurred in Bexar and in southeastern counties.

Several JAPANESE BEETLE (Popillia japonica) adults were collected near a canning plant at Dania in Broward County, FLORIDA. These beetles originated with truckloads of green beans shipped in from out-of-State. Appropriate regulatory measures were taken to eliminate the beetles in Dania and prevent further introductions. Japanese beetle developed the first known large brood in ALABAMA during 1967 in an area of Birmingham. In KENTUCKY, Fleming and Estill Counties were found infested for the first time. This compares with 11 new counties found infested during 1966. Japanese beetle caused occasional light damage to tobacco in VIRGINIA. Numbers were as low or lower than usual on apples. Populations were generally light except in west-central Virginia where counts were heavy. Scott County was found infested for the first time on July 21.

Japanese beetle populations for 1967 were slightly above normal for the second consecutive year in all areas of MARYLAND. Larval damage to lawns was light throughout NEW JERSEY. Although larvae increased sharply in turf areas in the eastern sector of PENNSYLVANIA, numbers are still well below the serious injury level. Japanese beetle infestations were erratic in RHODE ISLAND. Populations were very heavy on some properties, very light on others. There was some evidence that the trend toward a buildup that was noted in 1966 continued in 1967. Evergreens appeared to have been infested more than usual during 1967. The first Japanese beetle adults of the season in the northeast were observed as follows: July 5 at East Granby, CONNECTICUT, and Elmira, NEW YORK; July 6 at Rutland, VERMONT; July 10 at Northampton, MASSACHUSETTS; July 11 at Burlington, and Bellows Falls, Vermont; July 18 at Dover, NEW HAMPSHIRE; July 19 at Portland and July 21 at Lewiston, MAINE; and July 20 at Concord, New Hampshire.

Japanese beetle adult emergence began in the latter half of June in southern OHIO and in early July further north. During July adults were observed feeding on a variety of foliage including sassafras, blackberry, rose, plum, elderberry, grape, flowering crab apple, sycamore, soybeans, and corn silks. Approximately 18,000 traps were used to continue the survey program in MICHIGAN. Areas surveyed included Metropolitan Detroit, Ypsilanti, rural Monroe and Lenawee Counties, Lansing, Battle Creek, Grand Rapids, and rural Berrien and Cass Counties. Collections were relatively high for the season, with heaviest collections in the Battle Creek area. There, the catch peaked August 19-25 when 526 adults were taken from 412 traps. Sizable collections were made in rural Monroe and Lenawee Counties. The only new infestation was found in Chickaming Township of Berrien County. No finds were made in Lansing, Bay City, or Grand Rapids.

Japanese beetle infestations were restricted to soybeans in the Kentland and Ade areas of Newton County, INDIANA. Adults emerged during late July and early August. Counts ranged up to 7 beetles per plant in a few scattered fields, indicating a large population decrease in 1967 compared with 1966. Light infestations were reported in Clark, Jefferson, Jennings, Switzerland, Clay, Putnam, and Daviess Counties. Attractant traps were used in many key locations in IOWA during 1967, but no Japanese beetles were found in the State. No specimens were taken in the 4,520 traps placed in the St. Louis area, MISSOURI, in 1967. This is the first time in many years that no beetles were taken in this area. Trapping results were also negative in 21 other counties. Treatment was not considered necessary in view of the 1967 survey results.

Surveys conducted for KHAPRA BEETLE (Trogoderma granarium) in 24 States during 1967 were negative. No infestations are known to occur on the North American continent.

A single MEDITERRANEAN FRUIT FLY (Ceratitis capitata) was trapped at Miami Beach, FLORIDA, October 10, 1967, the first detected in the State since 1964. Intensified trapping revealed no additional specimens. No control or regulatory program was established.

MEXICAN BEAN BEETLE (*Epilachna varivestis*) infestations were observed 2-3 weeks weeks earlier in 1967 than in 1966 in the Boise and Rupert areas of IDAHO. Eradication programs were administered by the State.

The sterile MEXICAN FRUIT FLY (*Anastrepha ludens*) releases by Plant Pest Control Division in Baja California, Mexico, were started in April and continued into October. Monitor trapping by the CALIFORNIA project accounted for 1,231 sterile flies. No "wild" Mexican fruit flies were collected in California in 1967.

MORMON CRICKET (*Anabrus simplex*) populations were down with only a few small non-economic infestations on the range in UTAH. One band occurred 4-5 miles west of Randolph, Rich County, in early summer. Survey of former outbreak areas showed only light infestations on one area near Maverick Point, northwest of Blanding in San Juan County. In NEVADA, except for 100 acres in Eureka County, all Mormon crickets observed were well scattered and in the solitary phase.

A single ORIENTAL FRUIT FLY (*Dacus dorsalis*) adult was trapped in the Anaheim area of Orange County, CALIFORNIA, in January. In 1966, single males were trapped twice in November and twice in December. Intensive trapping and fruit cutting did not reveal an established infestation.

ORIENTAL WOOD BORER (*Heterobostrychus aequalis*) was found in sufficient numbers during 1967 to indicate that it was established in FLORIDA at several locations. This is the first established infestation in the United States. Most collections were made around such port cities as Fort Lauderdale, Miami, Tampa, West Palm Beach, and Jacksonville. Host material was Philippine mahogany and oak lumber. Survey and detection procedures were increased.

PINK BOLLWORM (*Pectinophora gossypiella*) was much heavier in ARKANSAS in 1967 than in 1966. Recovery was heavier in gin trash than in several years. Larvae were recovered for the first time in Arkansas, Crittenden, Desha, Jefferson, Lincoln, Monroe, and Phillips Counties. During late summer and early fall in MISSOURI, 230 lure traps in approximately 80 fields in four counties were negative for pink bollworm. No gin trash was inspected due to the poor cotton crop and the below normal number of gins in operation. Lint cleaner and trash inspections indicated that field populations increased generally in all OKLAHOMA counties surveyed in 1967. Pink bollworm was present throughout most of the growing season in the Trans-Pecos area of TEXAS. Unusually high numbers were reported during the latter part of the growing season in the Trans-Pecos and Rolling Plains areas of the State. The pest was a serious problem in Eddy, Chaves, Dona Ana, and Luna Counties, NEW MEXICO. Light to heavy populations were also found in green bolls in most southern counties late in the season. The spread north in Dona Ana County was more pronounced this year than it has been in the last 10 years. Heavily infested bolls occurred as far north as the Hatch and Garfield area this fall. This pest continued serious in cotton in most of southern New Mexico. Although not general in nature, heavy infestations in many fields of Dona Ana, Chaves, Eddy, and Luna Counties caused serious economic losses.

Larvae were first found in bolls on the soil surface in fields planted to grain during late February in ARIZONA. Heavy larval infestations appeared throughout the State by mid-June in blooms and small squares. Larvae were active from July to December in all unopened green bolls. Moths started emerging in late March and continued to emerge through December in all cotton-growing areas of the State. Pink bollworm populations in Nye County, NEVADA, were above 1966 levels with 354 adults collected in sex lure and sex lure-argon light traps and 219 larvae and 1 pupa collected in gin trash from 2,200 acres. No cotton was grown in Clark County in 1967. Infestations of pink bollworm developed in all areas of CALIFORNIA where moths were trapped, including the Bakersfield area of Kern County, where the first 6 larvae were collected from 2 locations in November. South of the Tehachapi Mountains, eradication treatments were applied at Cantil, Kern County, 22 times. Suppression treatments were made in the desert areas, approximately 200 miles from Cantil. In the Bard and Imperial Valleys, treatment was on a qualifying basis when the infestation reached 10 percent. Suppression treatments were made in the Palo Verde Valley in Riverside County and at Needles and in Sandy Valley in San Bernardino County. During the season, treatments were applied to 20,775 acres of cotton. Infestation was much reduced by treatment, but spread into the southern tip of the San Joaquin Valley. Sex lure traps were operated throughout the season and were supplemented with bloom inspection, green boll inspection, light traps, gin trash inspection, and lint cleaner inspection.

Controls for RANGE CATERPILLAR (Hemileuca oliviae) were applied to a total of 470,287 acres of rangeland in NEW MEXICO as follows: 456,202 acres in Union, Colfax, and Harding Counties and 14,085 acres in Lincoln County.

SOYBEAN CYST NEMATODE (Heterodera glycines) losses increased greatly in the infested areas of southeast MISSOURI during 1967. Infestations apparently occur in most soybean fields in this section of the State. Many more fields were damaged in 1967 than in previous years. Damage appeared to be at least twice the 3-million dollar loss which occurred in 1966. This pest was found in a 5,000-acre area known as the Columbia bottoms in St. Louis County in early October. Cysts were numerous in several fields. Damage was not noted at the time of discovery. Most recent findings show it is present in one field in Lincoln County, Missouri, which is the northernmost infestation in the United States. A large acreage is likely to be planted with resistant soybean varieties in 1968 in southeast Missouri. Soybean cyst nematode was found for the first time in FLORIDA (Escambia County, September 8), LOUISIANA (Richland Parish, June 29), and INDIANA (Vanderburgh County, confirmed March 2). This pest was also found for the first time in 12 counties in 6 States.

SWEETPOTATO WEEVIL (Cylas formicarius elegantulus) findings in sweetpotato storagehouses at Tabor City in Columbus County, NORTH CAROLINA, made the greatest impact on this program in 1967. Several thousand bushels of sweetpotatoes were completely destroyed. A second infestation was found in a storagehouse in Robeson County. Immediately following the discovery of the pest in North Carolina, a State quarantine was invoked. This quarantine restricted the movement of sweetpotatoes from infested areas. Warehouse operators and growers were required to remove all sweetpotatoes from the infested areas. Stored sweetpotatoes were destroyed by burying and/or fumigation and seedbeds were fumigated. All warehouses were treated also. Following the discovery of infestations in Columbus County, there was much increase in activity on the sweetpotato weevil program in SOUTH CAROLINA. This was especially true in Horry and Marion Counties where the potato-growing section of these counties adjoins the potato-growing section of Columbus County where some bedding stock had been obtained. Counties found infested for the first time in 1967 included Decatur in GEORGIA; Wayne in MISSISSIPPI; Brunswick, Columbus, and Robeson in North Carolina; Horry in South Carolina; and Caldwell Parish in LOUISIANA.

Surveys were conducted for WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) in CALIFORNIA with the following results: Fresno, Fresno County, negative; Livermore, Alameda County, negative; Stratford, Kings County - 2 colonies found in August; Sacramento, Sacramento County - few live colonies found at midseason; Davis, Yolo County - one live colony found at midseason; Roseville, Placer County - new infestation involving 9 city blocks found September 5; Placerville, El Dorado County - new infestation involving 4 city blocks found September 16. Treatments were made in all areas except at Livermore.

WHITE-FRINGED BEETLES (Graphognathus spp.) continued to spread eastward in FLORIDA during 1967. Counties found infested for the first time included Wakulla, Madison, Suwannee, and Columbia. Additional infestations were found in most other northwest counties. Delimiting surveys resulted in the discovery of new spot infestations in 24 GEORGIA counties. Infestations were found in Brooks, Grady, Heard, Lanier, and Rockdale Counties for the first time. White-fringed beetles damaged numerous isolated peanut fields in southeastern ALABAMA. These pests are now known to occur in all counties in Alabama, Barbour County having been found infested for the first time during 1967. New areas of infestation occurred in most other counties. An infestation of approximately 1,500 acres was found at Crossville, De Kalb County, in close proximity to three large nurseries. Infestation is now general over the cities of Anniston and Gadsden. In MISSISSIPPI only six counties remain uninfested with white-fringed beetles. Infestations were found for the first time in Alcorn, Pontotoc, Chickasaw, Monroe, Claiborne, Jefferson, and Franklin Counties this year. Infestations of white-fringed beetles were found for the first time in Bienville, Claiborne, Lincoln, and Morehouse Parishes, LOUISIANA. Extensions of known infested areas were found at a number of locations, and newly infested areas were found to be more widespread this year. A limited amount of survey was made in eastern TEXAS. The State remains noninfested. New areas were found infested in east-central ARKANSAS in July and August. Counties found infested for the first time were Lee, Phillips, and Randolph. White-fringed beetles have not been found in southeastern MISSOURI where an extensive survey was conducted in 12 counties.

One of the more important developments of the white-fringed beetle program in TENNESSEE was the finding of an extension of the isolated Greene County infestations. Other surveys in the State showed minor extensions of known infested areas in some counties. In SOUTH CAROLINA, an infestation of white-fringed beetles was found for the first time in Chesterfield County. Extensions of known infested areas were found in Darlington, Florence, Lexington, Orangeburg, and McCormick Counties. Surveys in NORTH CAROLINA resulted in the finding of extensions to infested areas in Alexander, Anson, Catawba, Robeson, Rowan, Stanly, Union, Alamance, and Pender Counties. Adults of *G. leucoloma striatus* were found in Scott County, VIRGINIA, for a new county record and in the independent cities of Hampton and Newport News for the first time.

WHITE GARDEN SNAIL (*Theba pisana*) occurs in a 7 city-block area of Manhattan Beach in Los Angeles County, CALIFORNIA. Eradication treatment continued during the period of activity. Survey was negative for additional areas. Treatment has been very effective.

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SOUTH DAKOTA
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TEXAS
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VERMONT
J. W. Scott

VIRGINIA
J. D. Rowell

WASHINGTON
J. T. Pennell

WISCONSIN
M. S. Conrad
O. L. Lovett

Included in the "Summary of Insect Conditions in the United States - 1967" are the following special reports:

1. The highlights section of Forest Insect Conditions in the United States - 1967, compiled by the Forest Service, U.S. Department of Agriculture.

2. Screw-worm (*Cochliomyia hominivorax*) Summary compiled by Animal Health Division, U.S. Department of Agriculture.

3. The highlights section of the weekly weather summary for the United States - 1967, compiled by the Environmental Data Service U.S. Department of Commerce.

Migrations of the Painted Lady (*Vanessa cardui* (L.))

V. M. Stern

During the last week of February, thousands of painted lady butterflies began migrating northward through southern California. As of March 8, the intensity of the migration was similar to the flight that occurred in 1966 when this insect caused damage to crops in the Pacific Northwest and in the Midwestern States. Studies conducted in the Insect Ecology Laboratory at Riverside, California, since 1961 indicate there are millions of individuals that have yet to begin their migratory flight northward.

The main reason for the 1968 population buildup was the favorable winter rains in southwestern North America. First, a hurricane struck Baja California during the late fall 1967. The intensive rain germinated host plants over an extensive desert area to provide oviposition sites for the *Vanessa* butterflies that had returned to their annual overwintering breeding ground. During midwinter there were 2 general storms that brought rain to southern California, northwestern Mexico, and parts of southwestern Arizona. Finally on March 7 and 8 another rain storm covered most of the same area.

From March 11 to 22, a survey was conducted in Baja California, southwestern Arizona, and on the northwestern Mexican mainland to determine the total impact that the favorable winter rains had on *Vanessa* populations. The results of this survey will give a clearer indication of possible problems that may develop in the Pacific Northwest and in the midwest during the summer 1968.

Our data indicate that this butterfly follows certain migratory routes through the Western United States into the Pacific Northwest and across Wyoming and the Rocky Mountains into the Midwest. It is impossible to follow these migrations from our laboratory. In order to gain more knowledge of these migratory routes we are asking county agents to report flights of *Vanessa* in the Cooperative Economic Insect Report. These reports will also be helpful to other county agents further along on the migratory routes.

The migratory butterflies can be distinguished from the nonmigratory form by flight habits. When the adult is in a migratory phase, it generally flies continuously in a given direction. In southern California, southwestern Arizona, and in Baja California the flight direction is northward. In southern Idaho, Utah, Wyoming, and in the Midwest it may change direction. When the butterflies are in a nonmigratory phase, the adults fly very erratically in any direction. They will often stop to rest on the ground, to feed on flowers, or to lay their white eggs.

Any comments sent to the laboratory at Riverside would be greatly appreciated. These reports should include the extent of the area covered by the flights, the direction, the date of observation, and number of adults crossing between 2 stakes in a given time. Comments should be sent to Dr. V. M. Stern, Department of Entomology, University of California, Riverside, California 92502.

SURVEY OF FORAGE CROP INSECTS IN MASSACHUSETTS IN 1967

F. R. Shaw [1]

Investigations on the abundance and seasonal distribution of forage crop insects and their parasites and predators were conducted during the period May 19 to August 15. Studies of alfalfa weevil (Hypera postica) abundance were continued until mid-November.

The alfalfa weevil continued to be the most numerous single insect pest of alfalfa but was less abundant than in 1966. Overall damage by this insect was less extensive in 1967 than during 1966.

The population of pea aphid (Acyrthosiphon pisum) increased in 1967 approximately doubling the 1966 abundance (17.8 percent of total in 1967). However, it has not reached the proportions observed in some previous years when it represented 50-60 percent of all forage crop pests.

Plant bugs also showed an increase in abundance from 3.7 percent in 1966 to 12 percent in 1967. Leafhoppers were much more numerous increasing from 0.80 percent in 1966 to 12.7 percent in 1967. Meadow spittlebug (Philaenus spumarius) increased from 0.87 percent in 1966 to 2.7 percent in 1967.

A summary of the results of the population studies is presented in Table 1.

Biological Control

Parasitism by an ichneumon wasp (Bathyplectes curculionis) increased in 1967. Alfalfa weevil larvae parasitized by Bathyplectes were collected from May 28 to July 13. From June 5 through June 15 parasitism ranged 1-90 percent, whereas in 1966, the highest percent of parasitism was 60.

Alfalfa weevil larvae parasitized by a eulophid wasp (Tetrastichus incertus) were collected from June through October. Parasitism ranged 17-80 percent during July, which was somewhat lower than in 1966.

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[1] With the assistance of M. C. Miller, J. Matuako, D. Miller, and C. P. S. Yadava

Table 1 Census of Forage Crop Insects in Massachusetts in 1967 2/

Insect Name or Group	Percent of Total 3/
Alfalfa weevil (*Hypera postica*)	48.97
Pea aphid (*Acyrthosiphon pisum*)	17.88
Leafhoppers	12.71
Plant bugs	12.00
Meadow spittlebug (*Philaenus spumarius*)	2.70
Grasshoppers	.80
Lepidoptera	.63
Miscellaneous beetles	.60
Sawflies	.52
Clover root curculio (*Sitona hispidula*)	.12
Beneficial Arthropods	
Nabis ferus	1.29
Coccinellids (lady beetles)	.59
Parasitic Hymenoptera	.49
Spiders	.44
Syrphids	.15
Chrysopids	.06
Pentatomids	.03

2/ Based on collection of 43,757 specimens.

3/ Figures rounded off to two decimal places.

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Coop. Econ. Ins. Rpt.
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